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THE

TRANSYLVANIA

JOURNAL OF MEDICINE

AND THE

ASSOCIATE SCIENCES.

EDITED BY

JOHN ESTEN COOKE, M. D.

Professor of the Theory & Practice of Medicine in Transylvania University,

AND

CHARLES WILKINS SHORT, M. D.

Professor of Materia Medica and Medical Botany in the same Institution.

VOL. I.

LEXINGTON, KENTUCKY.

PUBLISHED QUARTERLY

BY ALBERT G. MERIWETHER.

1828.

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PROSPECTUS

OF THE

TRANSYLVANIA JOURNAL OF MEDICINE,

AND THE ASSOCIATE SCIENCES.

In announcing the publication of a Journal avowedly emanating from the Transylvania School of Medicine, already the *alma mater* of so many distinguished practitioners throughout the Southern and Western States, the editors are happy to meet the wishes so often expressed by their brethren, while at the same time they are fully conscious of the responsibility of the task they have assumed. How far the anticipations formed of the reputation and utility of such a work may be realized, must be determined by the sequel, and on this head they would only observe, that the aid of all the Medical Professors is pledged for the sustenance of the undertaking. To the *alumni* of the school, now scattered over every portion of the Mississippi valley, several of whom have successfully contended with the best writers of the Eastern States, they confidently apply, not only for support in the way of subscription, but for the more valuable contribution of their pens; while they feel a hope that Western Physicians generally, wherever educated, will prefer a western medium, for making their communications public, to an eastern one.

"The Transylvania Journal," although *mainly* devoted to an exposition of the Medical Sciences, and especially to the Theory and Treatment of the diseases incident to the Southern and Western States, will not be confined in its view to these exclusively, but will embrace a survey of the Botany, the Mineralogy, the Geology and the Zoology of this section of the Union; and from naturalists residing in any portion of it, they would be pleased to receive communications on any of these interesting subjects. Having truth in view, and truth only, they will gladly hail it from whatever quarter it may come. This

Journal, therefore, shall be free for every communication, having for its object the advancement of Medical Science, or its kindred studies.

Reviews will occasionally be made of recent works on Medicine, Surgery, &c. by which they hope that students of Medicine and Junior Practitioners will be aided in their judgment of books; and, in the selection of Libraries, be enabled to order such publications as will most materially aid them in their treatment of Western and Southern diseases.

The extensive collection of Medical Journals regularly received by the Libraries of the University from every part of the United States, as well as the more select ones of Great Britain and the continent of Europe, will enable the editors of "The Transylvania Journal," to lay before its readers, at the earliest moment, the more valuable papers contained in any of these, together with a compendium of all their most useful matter.

CONDITIONS.

1. The "Transylvania Journal of Medicine and the Associate Sciences," will be published *quarterly*, in octavo form; each number containing 150 pages, forming a volume of 600 pages in the course of the year.

2. It will be printed with a new type, and on the best paper that can be procured in the Western country.

3. The first number will be published during the month of February next, and afterwards regularly on the 1st of that month, May, August, and November.

4. The price to subscribers will be *three dollars* annually, payable on the receipt of the February number, or *four dollars* upon the delivery of the 4th number.

All communications intended for this Journal, should be addressed (*post paid*, if sent by mail,) to the publisher A. G. MERIWETHER.

Lexington, December 1, 1827.

PREFACE.

In offering to the attention of Physicians a new periodical work devoted to the advancement of Medical Science, the editors deem it proper briefly to state their views of its present condition, and of the best mode of improving it.

When we consider how warmly the great questions in the different branches of the science are agitated, it must be acknowledged that there is yet much to be done. Our attainments in physiology are very limited. The functions of some parts, which, from the quantity of blood they are supplied with, must have some important office assigned them, are entirely unknown; with those of others of the utmost consequence, we are very partially acquainted. The great questions in pathology are in a very unsettled state; many of them are still warmly agitated, and some eminent men, despairing of ever attaining to the knowledge of the true theory of disease, seem to consider enlightened empiricism the utmost we can hope for. There are also not a few unsettled points in the practice of physic. Some physicians administer certain medicines, not only with safety but with marked benefit, in doses which alarm others who have not been led by the circumstances of their practice, to the necessity of going beyond what is common. The precise circumstances in which this practice is required, and the extent to which it may be safely carried, are perhaps yet to be ascertained.

These arcana in Physiology, Pathology and Therapeutics, are yet to be revealed. By patient observation truth must at length prevail. It is by this that all the natural sciences have been raised from the same state of uncertainty that still in a considerable degree prevails in medicine. It is in this point that we are most deficient. If we have suffered ourselves, in our eagerness in the pursuit of knowledge, to be misled by the ignis fatuus, hypothesis, let us not despond, let us revert to first principles, to experiment and observation, and to rigid inference from them.

Upon the younger members of the profession, whose minds are more open to conviction, we particularly call, in hopes of impressing them with the desire to examine the grounds of their belief in the doctrines they have adopted, and to test them by a comparison with the phenomena observed in the human system in health, or under the influence of the remote causes of disease. Many of them have leisure in the first years of practice, which they cannot employ more usefully or more honorably to themselves, nor more beneficially to the science, than in these investigations. Some have the good fortune to be so easy in their circumstances, that they have every opportunity of devoting themselves to the improvement of medicine. Such of these as do

not feel willing to submit to all the privations and fatigues of practice, may profitably employ their time in physiological investigation.

The physicians of the South and West, we would particularly remind, that the peculiarities of our autumnal diseases call for a treatment somewhat peculiar; that we have by necessity been compelled to adopt a more energetic practice than is required by the diseases of the North and the East; that those who are at the head of the practice in the great cities on the Atlantic coast, accustomed to the almost ephemeral fevers which appear on the clean surfaces of their swept pavements, and to the minute doses required to cure them, listen with an air of incredulity to accounts of the formidable fevers of the South and West, and of the active measures necessary in the treatment of them; consequently their experience and the rules of practice founded on it, should not bind us who have more malignant diseases to contend with. The history of medicine shows that it is amid the terrible fevers of the South that experience is to be acquired; and that it is to those who are there employed, that the physicians of the North are indebted for the knowledge of the successful mode of treating those high grades of fever when they occasionally make their appearance among them. Thus Dr. Rush was indebted to Dr. Mitchell for the prescription of jalap and calomel, to which he so feelingly acknowledges he owed his success in treating the yellow fever of 1793 in Philadelphia: so the English physicians of highest name, from Lind to Blane and Johnson, gained their experience in the treatment of fever in the East and West Indies.

It is then from the experience of the South and West that we are to learn, if we would ascertain the best mode of treating the malignant fevers we have to combat. Let us then depend upon ourselves, upon our own experience: let us be our own teachers: let those who have acquired knowledge by experiment and observation, communicate it: let them not go down to the grave in possession of information of the utmost importance to the welfare of their fellow men, of their fellow citizens, of their own descendants. Let them record that which they have found beneficial, and let it be said of them that they have deserved well of mankind by their labours, and by the diffusion of knowledge. Let them remember also that while they are communicating they may receive benefit; and that an interchange of views and modes of practice, like an interchange of commodities, is mutually advantageous.

To those physicians then of the South and West, who may be disposed to communicate to the public the result of their experience and observation, the pages of this Journal are freely tendered, and although the editors anticipate no lack of useful matter from more immediate sources, yet they hope that they will ever be actuated by a spirit of becoming courtesy towards their distant brethren.

THE TRANSYLVANIA

JOURNAL OF MEDICINE,

AND THE ASSOCIATE SCIENCES

VOL. I. FEBRUARY, 1823. NO. I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Observations on Injuries of the Head.* By BENJAMIN WINSLOW DUDLEY, M. D. Professor of Anatomy and Surgery in Transylvania University, Member of the Royal College of Surgeons, London.

THE great authorities of Europe and of our own country have laid down certain principles by which practitioners are generally governed in the treatment of injuries done to the scalp, cranium and brain. Since the publication of Mr. Abernethey's invaluable paper on injuries of the head, it might seem that little remains to be done in that department of surgery, while it is more than probable that under the present organization and management of the crowded hospitals of the large cities in Europe, no interesting and salutary innovations will be suggested: whereas in the United States, and especially in the valley of the Mississippi, where there is comparatively no human misery, no remarkable excesses in luxury, no crowded manufactories, and no large cities; where every individual partakes of nourishment equally healthy and invigorating, the fairest prospect is offered of giving new and increasing interest to this subject.

The objections to the use of the trephine as urged by Dessault, Bell, Pott, Boyer, and all the modern surgeons of the large cities, are known to be inapplicable in the practice of country situations. But while experience among surgeons in villages and country situations, has corrected impressions drawn from observations made in large cities and crowded hospitals, on the use of instruments in injuries done the cranium, it is apprehended that a still greater departure from city authority is called for, in order to secure all the benefits of which the profession is susceptible in the order of cases under consideration. It would appear manifest to the reader, that the rules laid down for the treatment of injuries done to the head, have been established in practice, more especially from a reference to the dangerous consequences of the use of instruments; while the present and the permanently healthy functions of the brain seem to have been an object of subordinate consideration. Those authors of standard character who have published their views on the use of instruments, have borne in mind the dangers subsequent to, and proceeding from the operation, more than the healthy performance for the time, of the various functions corporeal and intellectual; nor need it excite surprise that all operations on the head should be so generally disapproved of, when from particular circumstances, arising out of climate and situation, the most intelligent operative surgeons in large cities so often prove unsuccessful in the subsequent treatment of these cases.

That peculiarly destructive form of fever which so often attacks those persons who are the subjects of large ulcers, wounds, and compound fractures, when confined in the crowded hospitals of European cities, is unknown in Western America.

It is in the healthier portions of the great valley of the Mississippi, when violence has been done to the system, that nature makes her highest and most successful efforts at restoration; while the surgeon in attendance is called upon to do little more, than to guard against excess of recuperative power. It is then the present, and the ultimate security of the intellect, and of the various functions dependent on the inte-

grity of each portion of the brain, that claims more especially the superintending care of the surgeon in this country; since violence inflicted, either through accident or by an operation, is rarely esteemed irremediable in its consequences, except when all powers of reaction are destroyed.

A fracture accompanied by depression of a portion of the cranium beneath its proper level, with loss of sensibility and voluntary motion, wherein the integuments may or may not be injured, is occasionally treated with success without the use of the trephine; hence it is inculcated by the highest authority to abstain from the use of that instrument. A fracture accompanied by a depression of a portion of the scull, wherein the integuments are wounded, while a union by the first intention can be effected, and in which the faculties corporeal and intellectual remain unimpaired, presents a case, which according to sound principles in surgery, forbids an operation with the trephine. A fracture and depression of the scull accompanied by laceration of the integuments to such an extent, that suppuration must supervene as necessary to the process of restoration, calls for the operation of the trephine as a measure of prudence and caution, although no evidences are exhibited of an injury or loss of any of the faculties either of body or mind. The liability under such circumstances to symptoms of compression, from the presence of pus confined beneath and about the depressed bone, while the displaced bone becomes a cause of continued morbid excitement, renders the operation advisable in the earliest stages of such an injury. A fracture and depression however slight in character, in which there may have been no loss either of sensation or volition, with barely momentary effects proceeding from concussion, are not unfrequently followed by distant results so painful and destructive in their consequences, that a train of reflections has been excited, and an operation elicited at our hands, the result of which seems to offer an assurance that important improvements in the treatment of injuries of the head are still demanded, in order to afford all the assistance to which surgical skill may ultimately be subservient. It is not proposed to use arguments or to attempt ingenious reasoning, in or-

der to bring the subject fairly before the medical community. A faithful history of a few cases that have occurred in my practice within the last eight years, will secure more approbation among the enlightened in the profession, than all the visionary speculations the liveliest imagination could invent.

In the month of September, 1818, Mr. K. a carpenter of this town, called to consult me on account of a severe pain in the superior and posterior part of the cranium which had afflicted him for nine months. A succession of tumors had at various periods appeared about the seat of the pain. Upon an examination, in place of tumors, two very sensible depressions were discovered on the surface of the skull, attended by extraordinary sensibility in the integuments of the parts. About Christmas all the symptoms became aggravated and severe epileptic convulsions ensued. His convulsions were so frequent and violent in the latter part of winter that it was apprehended he would speedily fall a victim to his disease. During the progress of his case he had used large quantities of mercury, both in the form of unguent and of pills, and he was induced to believe that the mercurial unguent had an especial influence in aggravating his convulsions.

In the early part of the winter, I urged the propriety of trephining the cranium, under an impression that a morbid growth on the inner surface of the skull was now aggravating, even if it had not caused his malady. In April he determined as previously advised to submit to an operation. During the months of February, March, and the beginning of April, he was constantly confined with a severe affection of his head attended by violent epileptic fits every five or six days.

The trephine was used on the 16th day of April, two circular pieces of bone being removed, corresponding with and including those portions which by previous examination seemed to be depressed. The pericranium was remarkably thickened and morbidly sensitive. The bone was porous and admitted of large processes of this membrane and of blood vessels to pass directly to the dura mater.

The bone removed by means of the trephine was immediately in the direction of the longitudinal sinus, while there

was great difficulty in breaking up the connexions between it and the dura mater.

After the operation was completed I was astonished on turning my attention to the dura mater, to discover a copious secretion of fluid which separated that membrane from the surface of the brain more than half an inch; while that organ in place of giving to the finger a sense of pulsation, felt as hard and as unyielding as a board. The patient being dressed in the usual way, was put to bed and kept quiet until the fifth day, when from the establishment of free suppuration the bandages were removed. It was now ascertained on examination, that the fluid beneath the dura mater was absorbed. The brain had regained its proper level and pulsated with unusual vigour: no convulsion had occurred since the operation. The dressings being renewed, he was ordered a mercurial course of treatment with a view to correct the secretions and to promote the healthy action of the absorbents. At the expiration of three months he was perfectly restored to health, having experienced only two slight attacks of epilepsy during his recovery, while his head, which had for many months given him excessive pain, caused but little inconvenience after the operation.

From an occasional intercourse with this patient for many months after all professional attendance and advice were suspended, I am prepared to pronounce on the cure as radical.

In the spring of 1825, W. T. a young gentleman twenty-one years of age, in company with his mother, came to this place from South Carolina; and from the mother was received the following history of her son's case.

When five years of age, he received a severe blow accidentally on the superior and middle portion of the left parietal bone. Being at school, he was able to go home on foot without giving any particular manifestations calculated to excite alarm. On the ninth day he became suddenly apoplectic, and paralysis of one side ensued.

The paralytic affection gradually disappeared, so as to leave him in the enjoyment of his faculties, as well corporeal as intellectual, at the expiration of two months; but from that period he

became the subject of severe pain in his head, and especially about the seat of the injury he had previously sustained. From this time his constitution became exceedingly delicate and excitable, with disinclination for exercise, and liability to faintness after the slightest exertions: finally about his fourteenth year, nine years after the reception of the injury, he became the subject of epileptic convulsions. These had ever since continued to recur at irregular intervals of two, three, or four weeks, varying with the occasional causes which for a time invited or retarded their appearance.

He had been but a short time the subject of epilepsy, until a most manifest improvement in his constitution took place.

His personal appearance and constitutional vigour being much changed for the better, his former excitable habit, with his liability to faint after every slight exertion, now left him. But these flattering symptoms were soon followed by a perceptible injury of his intellect, insomuch that it became useless to confine him longer to his studies in school.

The physicians of his vicinity who were consulted, differed in opinion concerning the cause and seat of his malady, as did most of those in the southern states, to whom application was made for professional assistance. The father of the young man had by letter consulted professors Physic and Chapman, who discouraged any effort at relief by an operation, because of the protracted character of the case, while a rigid regard to abstemious living was advised as necessary to render the convulsions more mild in character.

After receiving this history of the situation of the patient from the mother, upon turning to himself with a view to additional information, I observed a stammer in every attempt at enunciation; while his memory had become so entirely treacherous, that he could no longer recite with any degree of accuracy, an event which had transpired within two days, his recollection being good however, in relation to circumstances of his childhood. For most particulars in relation to his daily history, even in reference to the operation of a dose of medicine, it was necessary to consult his mother.

A cicatrix on the side of the scalp pointed out the seat of the original injury. Under all these discouraging circumstances, after a few days preparation, the operation was resorted to on the 10th of May, 1825, to relieve him of an injury, the consequences of which had been accumulating upon him for sixteen years. A small depression of bone appearing manifest, corresponding with the original site of the injury, indicated the point upon which to apply the trephine. The crown of the instrument was made to embrace the depressed bone, which when removed, presented a process projecting from its inner surface about one inch in length, of the size of a small quill at its base, the extremity tipped with soft cartilage. This spiculum of bone had penetrated the dura mater, and communicated with a large preternatural sinus, from whence issued a stream of blood as thick as a man's little finger, which continued to flow from the instant the bone was removed, until from the quantity lost, it was judged proper to check it by means of pressure.

The dura mater was diseased, presenting a dark blue appearance over a space nearly as large as the opening in the cranium made by the trephine; while the sinus beneath appeared to be, from an examination made by the little finger, more than an inch in depth, and of equal width.

The disposition to hæmorrhage was checked in a few minutes by means of pressure with the thumb, and being now satisfied that the trephine was not further necessary, it was proposed to cleanse and dress the wound. Before the dressings were applied, an alarming convulsion came on, during the continuance of which, a stream of blood issued through the opening in the dura mater, that projected three or four feet. A second and third convulsion ensued, with like discharges of blood from the opening of the dura mater, before the patient could be placed in bed. For six or eight hours after the operation, he remained in an insensible state, and then his natural feelings and reason returned.

It was now supposed, whatever might be the termination of the case, the cause originally productive of the disease was removed. From bloody water, the discharge from the wound

changed in the course of twelve hours to a colourless serum, and for three days and nights in succession, it was so copious as to make it necessary to change towels, pillows, bolsters and sheets, two or three times during the day. Those young gentlemen who assisted in dressing and attending to the case, insisted that the entire amount of serum discharged, could not be less than two gallons. On the morning of the fourth day, the dressings were dry, and in some few hours after, suppuration became manifest. The wound was now dressed with adhesive plaster, which was renewed daily for about thirty days, when it was healed.

The patient had no convulsion after the day on which the operation was performed; a manifest improvement in his memory became perceptible in a few days to all around him. His stammer, which appeared to proceed from an indistinct recollection of things, very suddenly vanished, his eye which had been half closed, heavy, and inanimate, was now sprightly and intelligent. In ten days he left his room, and at the end of six weeks, he returned home in the enjoyment of perfect health; travelling a distance of five hundred miles in the month of July, in ten or twelve days.

A few months after this young gentleman returned home, I was informed that by excess in eating and drinking, together with severe exercise in dancing, a slight epileptic attack was produced.

He is, however, as I have been very lately informed, through a letter received from an individual affected as he formerly was, now in the enjoyment of uninterrupted health.

Gofourth, a young man of Jessamine county, Kentucky, aged twenty-three years, when five years old, received a kick from a horse, which fractured and depressed a portion of the right parietal bone. The immediate symptoms were not particularly alarming, notwithstanding a wound also in the scalp, nor was there any extraordinary defect either in general health or constitutional development, until about the fifteenth year of his age, when, without any assignable cause, he had for the first time an epileptic convulsion.

From that time he continued to be the subject of epilepsy every second, third, and sometimes fourth week, according as the exciting causes acted with more or less intensity. The continuance of epilepsy for eight years, had reduced his constitutional vigour, and rendered his system morbidly excitable. The condition of his mind was still more deplorable, his memory having undergone almost a total extinction. In the latter part of February eighteen hundred and twenty-six, after spending a few days in preparing the system, the operation was performed in the amphitheatre, in the presence of all the class.

The external incision being made, the trephine was applied in such a manner as to cover the larger portion of the depressed bone. In two or three turns of the instrument, the cranium was penetrated in one point of the circle; and through this opening, which could have been closed with the small end of a surgeon's probe, transparent colourless serum flowed during the balance of the operation.

The circular piece of bone being removed, the dura mater was found defective to the extent of a twelve-and-a-half cent piece of silver, which exposed a sinus reaching down to the petrous bone, near the base of the scull. A spinous process projected from the inner table of the bone about half an inch long, its base being of equal dimensions. A small portion of the spinous process was not included by the trephine; this was removed by means of a strong pair of forceps. The sinus in which the serum was collected, was large enough to receive a hen's egg. The patient had two light attacks of epilepsy on the second and third days after the operation; but on the fourth, suppuration was established, the dressings were renewed, and he began to give assurances of a successful issue by a more sprightly and animated countenance. Each successive dressing was accompanied by new evidences of intellectual and corporeal improvement; and at the end of the fourth week, the wound having cicatrised, the patient returned home in the enjoyment of perfect health. Early in the spring season, he accepted a situation as fireman on board a steam-boat trading between Louisville and New-Orleans, where he continued

until August, when the waters of the Ohio were too low for navigation. Being discharged from this laborious and hazardous occupation, he passed through this place on his return home, and reported himself to me as having enjoyed good health, with an exemption from his former malady.

Obrien, a man of middle age, came to this place in the summer of 1826, and gave the following history of his case. About four years previous to that time, while engaged in raising a house near Cleveland, Ohio, he received by accident, a blow on the side of his head, which deprived him of motion and of the use of his intellect for several weeks. He had scarcely recovered from the immediate effects of the injury, when he was attacked by severe convulsions, while he was never free from pain in his head, jaws, neck, chest, sides, and abdomen. Upon examination, I found most of the muscles of his system in a state of morbid contraction. The organs of speech were exerted with great difficulty, and his enunciation was very indistinct.

His senses of taste and smell were nearly destroyed—the fragrance of the rose and the offensiveness of the thorn-apple, were alike to him. His fingers were constantly in a state of semiflexion, while the abdomen was habitually and painfully tumid. I have never seen a patient under any circumstances, who appeared to be the subject of such unceasing agony. For weeks in succession, his convulsions recurred daily, producing most terrific contortions of his entire system. A large cicatrix, with apparent depression, extended in the direction from behind the external canthus of the right eye, to the central portion of the parietal bone of the same side.

After a few days delay with a view to preparation, the trephine was used; nor were there any very remarkable manifestations about the wound, except in the increased vascularity of the dura mater. But in the course of the same evening, after the operation, the patient expressed himself as being "unlocked" in all his limbs; while there was a most pleasing and perfect relief to the organs of speech. On the third day from the operation, suppuration having commenced, the wound was dressed; and thus far the patient gave the strongest manifestations of a speedy

recovery, in the relief of all pain in his head, throat, chest and extremities, and in his faculty of deglutition and of speech. The rigidity of the muscles and the tumid condition of the abdomen had also nearly disappeared. About the sixth day from the operation, he experienced a light epileptic convulsion. The relief, however, which had been afforded, was followed by a ravenous appetite, and he was constantly inclined to commit excess in eating, both in the quality and quantity of his food. By the tenth day from the operation, he had so far recovered as to be enabled to take exercise in walking through the town, while he manifested great impatience in being controled. From the tenth to about the twenty-fifth day after the operation, the patient had several light convulsions. He continued, however, to improve in his general health, and being impatient under farther restraint, withdrew himself secretly from my superintendance, and I have never heard of him since. This case, more than any other which has been under my charge, was attended by a highly deranged secretion of the liver, that rendered it necessary to use liberal and frequently repeated mercurial purgatives; and while the original causes of the affection may have been removed by the operation, I can readily conceive that the convulsions might be continued on account of the morbid condition of the liver. Under such circumstances, if now living, he may be the subject of disease that is under the control of medicine.

Froman, from the neighborhood of Bairdstown in this State, a man of middle age, received a blow on the posterior and superior portion of the left parietal bone, fifteen years ago, and came to this place for professional assistance in April 1827.

According to the best history given by his brother and himself of his case, a manifest defect of his memory was perceived in a few weeks after the accident was sustained; yet, it was two years before convulsions supervened, and these have continued to recur for the last thirteen years at very irregular periods, the patient sometimes having half a dozen a day, yet about every fifteen days, the convulsions are more sensibly severe. At present, he is in a state of fatuity. The tenuity of the integuments upon and immediately surrounding the cica-

trix, on the site of the original wound, gave deceptive appearances of slight depression of the scull at this part. When the bone was laid bare, however, in the operation, there was no preternatural appearance, except in the close and morbid attachments of the pericranium. A circular portion of the scull being removed by the trephine, the dura mater presented a healthy appearance, as did the bone also. Perceiving no pulsation in the brain, I pressed my finger on the surface of the dura mater, and discovered a considerable collection of fluid beneath it, which, in the opinion of professor Short and other gentlemen present, separated the brain from its investing membrane, not less than half an inch. On the fifth day from the operation, suppuration was established in the wound. The dressings being now removed, the brain was perceived at its proper level pulsating, while the whole of the fluid was absorbed. The progress of this case was extremely flattering for the first two weeks; after which, in consequence of indulging a craving appetite, and possibly because the operation was partial in its effects, the epileptic convulsions recurred, and thereby the benefits of the effort at relief are rendered extremely problematical. Some months after this patient returned home, I learned that his convulsions were less frequent and more mild in character, than they were previous to the operation.

In the history of the preceding five cases, conclusive evidence is given of the success of the operation in three; while in the other two, the result is not ascertained. A remarkable coincidence is to be observed between the first and the fifth cases, in the collection of fluid beneath the surface of the dura mater, and between that membrane and the brain. In the first, however, as soon as the fluid was absorbed, the pulsation of the brain was unusually high and vigorous; while in the last, it was feeble and indistinct. In the first, the disease was only of one year's standing, and the patient recovered after the operation without any unpromising manifestations. In the last, on the contrary, the disease being of fifteen years standing, the brain manifested but feeble capacity in regaining its healthy functions. The contrast between the second and third cases is not less interesting; the one being characterized by a large

preternatural sinus which communicated freely with the sinuses of the brain, and from which, during and immediately after the operation, a great quantity of blood was lost; while in the other, there was a very extensive sinus containing transparent serum in place of blood, which was discharged from the brain as soon as the trephine penetrated the cranium. There are good reasons for believing that morbid fluid collections occur within the cranium more frequently than is generally imagined. I am acquainted with the history of one case, where the motion of the fluid could be made audible to the bystander, by a sudden movement of the head.

Among a variety of other cases in which I have been consulted by letter and in person, is that of a child six years of age, who was kicked by a horse on the central and inferior part of the os frontis, involving the inner canthus of each eye. He became the subject of epilepsy in a few days after the injury was received, and at this time, two years since the accident, he is epileptic to a very great degree. Although applied to with a view to surgical assistance, I have not operated in this case, because I am unable, from external appearances, to point out the source of mischief—whether in the right or the left orbitar plate; in the posterior wall of the right or the left frontal sinus; or in the cribriform plate of the ethmoid bone, cannot be ascertained by any external appearances. The delicate and important character of the external soft parts involved in the operation, necessarily forbids all attempts, in such a case, unless the immediate sources of injury were made evident.

I have lately received a letter from one of the most promising young physicians of the west, Dr. Yandall of Tennessee, containing the result of an examination of the cranium of an individual who had died four years previously, of epileptic convulsions. It was recollected, that the individual had received a severe injury on his head before he became the subject of epilepsy, and the Doctor disinterred the remains, and made an examination with reference to cases under my care, with which he had become familiar. On the inner surface of the scull, immediately under the seat of the original wound,

spicula of bone of such magnitude and appearances were still manifest, as to leave no doubt on the Doctor's mind, that they were the cause of the death of this person. In thus gratifying a rational and elevated curiosity, Doctor Yandall has contributed important testimony on the subject before us.

I have not forgotten, nor do I wish to pass unnoticed, a remarkable case of epilepsy which occurred many years ago, and was cured by Mr. Cline, of St. Thomas' Hospital. The patient being admitted into the institution for some other disease, Mr. Cline discovered a depression of bone on one side of the head, which he was induced to remove by the trephine. Another and more remarkable case, of a sailor brought from the Mediterranean, who from a fracture of the skull had remained motionless and to a great extent insensible for thirteen months, was perfectly restored by the same distinguished surgeon, by the use of the trephine. These cases had a powerful influence in impressing my mind with the capacity of the brain to sustain long protracted embarrassment, as well as of the inestimable value of instruments in removing causes productive of morbid cerebral excitement.

The experience which time and circumstances have afforded in injuries done the head, induces me to depart from the commonly received principles by which surgeons are governed in regard to the use of the trephine. In skilful hands the operation beyond the atmosphere of large cities is neither dangerous in its consequences, nor difficult in the execution. With the views entertained on the subject of the all pervading influence of the chylopoietic organs, in producing a great variety of those diseases called surgical, I do not feel apprehensive of committing errors by the two frequent use of the scalpel and the saw. Surgical instruments are doubtless indispensible agents even in the most intelligent hands; and although they are rapidly on the decline in numbers and professional importance, in consequence of the publication of a more correct pathology; although science and truth have in many instances preserved the limb from the knife and the saw; still it will be admitted that the perfection of the science of healing, must embrace the use of instruments in all local affections which exist independent of constitutional causes.

Some estimate may be formed of the consequences resulting from preternatural pressure upon any portion of the surface of the brain, by reference to its influence on any of the other organs, or even the superficies of the body. It is true, the information thus obtained, is extremely limited, and consequently very defective in explaining the phenomena arising from pressure upon the brain, inasmuch as the latter organ constitutes the source of those great laws by which the various subsystems are held tributary to the single purpose of animal life, while the different subsystems are especially subservient to the development of cerebral functions.

An ill-shaped contracted shoe may be worn for a time without much pain or inconvenience; if, however, its use be persevered in, the consequence is a disordered action of the cuticle succeeded by an extremely painful affection. The exsection of a corn has occasioned tetanus and death. The presence of a piece of gravel in the heel of a boot may not be felt in the morning, while the weight of the body on that part may develop the sensibilities of the foot to such an extent as to put the individual into a state of agony by noon. A drop of water falling from a height upon any portion of the system excites no unpleasant sensation; but should drops fall in regular and rapid succession on the same part for two hours without intermission, the pain excited thereby could scarcely be equalled by the knife or the cautery.

The effects of pressure by points is the same, whatever the tissue upon which it is applied; it never fails to excite pain, while not unfrequently the most alarming constitutional symptoms supervene. Since the capacities for disease originate in the nervous development of each part, the susceptibilities to morbid action must correspond exactly with its nervous associations. When the injury then, is done to the seat of sense, motion, and intellect, we must be prepared to witness a great increase in the intensity of all the alarming symptoms. Surrounded and secured by a bony spheroid, in proportion as the brain is placed beyond the sphere of the ordinary causes of offence, its security being violated we are prepared to look to consequences the more fatal. Indeed, the only matter of astonishment is, that

when violence has been sustained, it should fail to derange the entire actions of the system.

Since the subordinate parts of the system are familiarly known to make severe complaint when kept under the influence of undue pressure, in place of feeling embarrassment at the task of showing the necessity at all times of relieving the brain from a similar condition, whether morbid manifestations be present or otherwise, it rather appears to constitute matter of astonishment that arguments in favor of removing pressure from any portion of its surface should be thought necessary in this enlightened period of the profession. That great violence is sometimes done without sensibly impairing any of the faculties, is admitted. It is matter of equal notoriety however, that cases frequently occur where injuries apparently the lightest in character are followed by the most disastrous consequences. A labouring man of this vicinity, received a blow on his forehead thirty years ago, which fractured and depressed the central portion of the bone to an extent sufficient to receive one half a large winter pear, and yet his only complaint is head-ach and dizziness during the heats of summer. Another case, which is by no means of rare occurrence, is that of a man with a slight fracture of the parietal bone accompanied by a very partial depression, wherein no unpleasant symptoms were manifest until the fourth day, when epilepsy supervened with death in eighteen hours after. Since it is impossible to predict the consequences of violence done the brain upon any portion of its surface, however slight in its nature, and however free for the time the patient may be of all morbid manifestations; and since it is made evident that disease and convulsions may occur at any period, from the moment it is sustained, up to twenty years after the injury, it appears to me, the great question to be decided, consists in the danger of using instruments upon a fractured cranium. There cannot be any variety of sentiment among professional men about the propriety, where this can be executed with safety, of removing undue pressure from any part of the brain's surface, in order to preserve this organ free and unrestrained in the performance of all its functions. It must be then, the single circumstance of the difficulty and danger attending the

removal of broken portions of the cranium, that shall govern the conduct of the surgeon: and since there is no danger to be apprehended in this country from that fever of large cities and crowded hospitals, incident to those who are the subjects of large abscesses, extensive wounds, and compound fractures, the principles by which we are to be governed, are of necessity very different from those inculcated by authors of the highest celebrity in reference to injuries done the head.

The trephine which has no teeth on the side of the cylinder is a very defective and dangerous instrument. *With these*, it combines the advantage of enabling the surgeon at will to vary the direction of the instrument, so as to correspond with the varying thickness of the circular piece of bone to be removed; a precaution never to be lost sight of, and with a due regard to it, there can be no danger provided the trephine be confided to cautious, firm, and intelligent hands.

Among bunglers, the lancet becomes a dangerous weapon. It is unnecessary to refer to those cases where the trephine has been successfully employed in taking away large portions of the cranium. In using it with a view to the cure of certain forms of epilepsy, and thereby restoring the healthy functions of the brain, it becomes a subject of particular interest to be prepared to designate those cases in which the operation is demanded with a view to cure, from others which, notwithstanding epilepsy supervenes upon morbid ossifications pressing upon the brain, are yet beyond the reach of all surgical skill. Of these I have within a few years had three very remarkable examples; two of which were produced by extensive ossifications of the longitudinal sinus, while the third was the result of a process of bone at least one inch in length rising up from the central portion of the os occipitis and piercing the cerebellum. The two first cases were attended by a small, feeble, and excitable pulse in the recumbent posture; while the slightest effort, as in changing position, produced a very extraordinary increase in the pulse. Muscular power was completely prostrate; vision frequently very indistinct; a sense of faintness was distressing in every attempt at exercise; and the head was acutely and almost constantly painful in the direction of the longitudinal sinus.

The symptoms altogether were so strongly marked, that after attending the first, I had but little difficulty in comprehending the nature of the second case. The injury done the cerebellum by the process of bone in the third case, was attended by increased appetite, by irregular fever and epilepsy. Upon dissection the lymphatic glands of the whole system of this patient, a female of twelve years, were found in a morbid and enlarged condition. The use of the trephine could not be justified except in cases of evident depression of bone, or of a morbid condition of it produced by violence or other causes, leaving thereby but little doubt in regard to the place upon which to use the instrument, as well as the practicability of removing the causes productive of morbid cerebral excitement. The character of the symptoms upon which an opinion is founded in regard to the causes of disease, is a subject upon which a professional man cannot be too scrupulously attentive. It is in the faculty of discriminating between the genuine and the occasional symptoms of disease, that the practitioner manifests his skill by his triumphant success in practice. In the second and third cases of epilepsy, the histories of which are recorded in this paper; one of which presented a collection of blood, the other of serum, each contained in a sinus of the brain, great diversity of sentiment was expressed by different physicians in regard to the original causes, and to the seats of disease at the times when the examination was made: nor is it certain that I should have been more fortunate than others, except for the particular attention bestowed on the early history of these patients' sufferings, and the preponderating influence which was attached to the primary symptoms in each. In each of those cases, epilepsy did not occur until more than ten years after the accident was sustained; while it is more than probable that the delay in this alarming symptom is especially attributable to the period of life when the injury was done the head.

This feature in the two with similar observations made on other cases, points out the necessity of bestowing the most cautious attention and care upon all cases where injury is done the scalp, and cranium of children.

Observations made on superficial injuries of the head, especially among children in whom some have terminated fatally, have called my attention to the subject with a view to practical results, independent of apprehensions in relation to the ultimate production of epilepsy. The constant liability among children to injuries of the head, and the frequent disastrous consequences that succeed to violence, supposed at first to be trivial in character, are facts familiar to all. The relationship sustained between the periosteum, and a similar membrane found in the cavities of all the large bones, is of a remote and very indefinite character; insomuch that a disease of the inner is rarely apprehended as a consequence of a diseased condition of the external periosteum. But in regard to the internal and external periosteum of the scull, or of the pericranium and dura mater, there is a relationship so close, an association so intimate, that the observing and intelligent practitioner never discovers a disease of the one, without being under more or less apprehension of a similar condition of the other.

If in disease of the head the external periosteum is found detached from the scull, wherein no local violence has been done and no local affection made manifest, it is received as good evidence of the diseased condition of the dura mater; as when the external membrane is diseased, the internal is peculiarly liable to receive morbid impressions by transfer or extension. Nor is this susceptibility on the part of the dura mater to sympathetic disease, restricted to its connexions with the pericranium; on the contrary there is a liability to receive by transfer erysipelatous affections of the head and face, so generally understood among practitioners, that the common local remedies consisting of lotions and other means directed with a view to subdue inflammations of this description on the body and extremities, are forbidden when a similar affection attacks the face or head.

A little girl while engaged in play fell and cut her head with the sharp edge of an axe, which disturbed very partially the pericranium for about half an inch, without producing any fracture of the bone. The wound was dressed by the mother. On the third day fever ensued, and the family physician was

called in. On the sixth day my attendance was requested with a view to perform an operation. I found the child insensible, with paralysis of one side, stupor and fever: in the course of the evening she expired. The external wound was dry and free from inflammation, while matter was extensively formed on the surface of the dura mater.

A small boy received a slight blow on the side of the head with a walking cane, which gave no inconvenience for the time and was therefore unattended to, the integuments not having been divided. About six weeks after, swelling and inflammation with suppuration ensued, and the case was treated as a common abscess. A physician was applied to several times with a view to give vent to new collections of matter in the abscess, and lastly the boy was placed under my charge three months after the original injury. By means of a common probe an extensive affection of the bone was rendered manifest, and in two or three days severe epileptic convulsions ensued. An attempt was now made by means of instruments to take away all the diseased bone; but this was found impossible by reason of the condition of the dura mater, the entire surface of which, was crowded with spicula of bone. The convulsions becoming more severe this patient died in a week after.

A little boy fell into a cellar and received a slight wound over the central part of the occipital bone. A physician being at hand dressed the wound with a view to union by the first intention, and notwithstanding the integuments united, yet at the expiration of two months the child continued to suffer. I was now required to see him. The integuments for an inch and a half in breadth about the seat of the injury were much swelled and very painful. The child also conplained of pain in his head and would sleep only on the carpet, where he was moaning and tossing during the entire night. With this history before me great apprehensions were entertained of an unmanageable disease of the cranium, dura mater, and brain. Active mercurial cathartics were ordered, and these were repeated daily for three weeks before the more alarming symptoms were subdued. A discharge was now established over the site of the injury by means of a blistering plaster, and the mercurial

cathartics ordered every other day. This treatment was continued with slight variations for two months longer before he was finally relieved.

A young man by a casualty received a slight blow on the side of his head, and no precautions were taken to render himself secure against the consequences of such an injury. Eighteen days after he was attacked with fever, great derangement of the digestive organs, vomiting, acute pain immediately in the seat of the injury, incipient inflammation, and delirium.

The precise character of the disease and the original source of the symptoms in this case became a subject of warm discussion among the attending physicians. Provided the symptoms originated in the injury done the head, satisfactory reasons could not be assigned for the delay in their manifestation.

If the case was purely bilious, then the pain in the seat of the injury done the head remained to be explained. The propriety of trephining the cranium was agitated; but in the mean time the patient was induced to take an emetic, and this was followed by a mercurial cathartic, the conjoined influence of which gave so much relief that it was proposed to wait upon a repetition of these medicines. Two or three emetics and as many doses of calomel in the course of six days placed the patient on his feet in good health.

A boy received a cut on his forehead which suppurated copiously in a few days after. By exposure to cold, fever was excited, when suppuration became suddenly suspended. Aversion to light ensued with pain in the head and delirium. By means of the active influence of emetics and mercurial cathartics all the alarming symptoms subsided in two days, suppuration was restored, and the patient was speedily well.

A negro boy ten years old, had his head caught between the upright pieces of timber which enclose the principal wheel and the horizontal shaft, by which the whole machinery of the horse-mill is put in motion. The entire left side of the scalp, beginning at the external angle of the left eye and reaching thence over the superior part of the head terminating behind the mastoid process of the os temporis, was separated from the cranium. Two thirds of the parietal bone was deprived of

pericranium, the temporal muscle was separated from its origin as low down as the jugum; the external angular process of the os frontis was broken off, the ear hung upon the side of the neck. On the right and very near the head, there was a severe bruise and deep impression on the neck made by the post upon which he had been pressed by the shaft. On visiting the boy three hours after the accident I found him rational, with a very quick and irregular pulse. The hair being removed and the wound cleansed, the scalp was replaced and retained by means of strips of adhesive plaster. In consequence of the great chasm beneath the integuments, produced by the destruction of the temporal muscle with a large portion of periosteum, extensive suppuration ensued, notwithstanding three fifths or more of the scalp united at its edges by the first intention. Pus discharged very freely both at the anterior and posterior extremities of the wound, and yet it became necessary to give it an exit just above the zygoma also. From the degree of fever, constipation and delirium to which the patient was constantly disposed, it became necessary to keep him uninterruptedly under the influence of antimonial and mercurial medicines; nor was it until after a severe struggle of twenty-eight days, that suppuration, chylopoietic derangement, fever, and delirium, were fairly brought under the controul of medicine, and the patient thereby placed in a state of safety. For the first twenty-five days, it appeared that life was suspended upon the active influence of each day's prescription: at the end of two months, he was completely restored to health.

The above cases are not reported from any peculiarity in their character, since every physician of some age and experience is able to furnish many of a similar kind. The morbid physiology and pathology involved in them, are principles of paramount importance with the practitioner. These have not commanded that attention to which, by their importance, they are entitled; nor is the profession susceptible of rational improvement through any other medium. Physiologists have considered the human system too much in detail; and hence the classification of local diseases, transcends very far the limits

of truth, while its fatal influence in practice is so extensive, that a rational estimate would bear the aspect of extravagance.

The incomparable paper of the English surgeon and philosopher, on the constitutional origin and treatment of local diseases, will render the name of its author familiar with posterity, when the marble and the granite in the monuments of the ancient cities shall have mouldered and been forgotten. The human system is indivisible: however numerous the various sub-systems entering into its entire anatomy, each one is dependent on all the others in the performance of its functions, while the result of the combination is unity. This being true, and it is thought no person will attempt to controvert a position founded in nature, the number of local diseases must be extremely small, compared with the long list as laid down by authors.

The various affections of the head exhibit a great variety of symptoms confined to this particular part; yet these compose but a small number when compared with various symptoms in different portions of the system, resulting from the same cause. The long catalogue of *mimoses* of a distinguished author, amounts to little more than chylopoietic derangement. The cutaneous diseases of Willan and Alibert are, at least so far as we are rendered competent to treat them, referable to constitutional origin. But while local diseases are so generally of constitutional origin, there are primitive local affections which influence every tissue of the system. The various organic affections of the heart, present most prominent evidences of the truth of this position. Not an organ or tissue of the system escapes its influence; each one in succession is made to complain for the heart, in its various diseases, while it complains most rarely for itself.

The intimate relationship manifested between the brain and the chylopoietic viscera, in morbid as well as in healthy action, is the strongest and most indissoluble law of the animal œconomy. An affection of one of these as a consequence of a diseased condition of the other, is even more common than for each to make its own complaints. Daily evidences are offered in practice of an especial connexion between the morbid

and healthy states of the functions of the brain and liver. A slight concussion, a small bruise, or a limited wound of the scalp, is not so liable to become dangerous in its consequences, except when the digestive system is performing a conspicuous part in the chain of morbid action. The peculiar liability of the chylopoietic organs to morbid impression, from constant exposure to irregularities in eating and drinking; from the copious, languid and peculiar character of their circulation and secretions, renders them especially obnoxious to translations of morbid cerebral excitement. Hence it so often happens, that the first evidences of a dangerous condition of the brain consequent to a bruise, wound, or concussion, are to be found in a highly morbid condition of the digestive system, with symptoms reflected back upon the original source of the complaint. With these facts before us, than which as I conceive there are none more susceptible of being maintained in pathology, the indications with a view to the restoration of health cannot be easily misunderstood. Considering the digestive organs in their proper character, receiving and operating upon the crude materials thrown upon the stomach, either with a view to the nourishment and growth of the system, or for the more sensual purpose of ministering to enslaving appetites and propensities; connecting this unceasing and ever varying duty with the anatomy of the organs concerned in the process of chylification, in place of referring but a certain class of diseases to the deranged actions of these organs, it rather becomes matter of surprise, that almost the entire catalogue of human infirmities, as referable in their origin to the condition of the digestive system, has found so few advocates and supporters. This effort to trace the source of disease to the digestive organs, was the more particularly to be expected, inasmuch as they constitute the avenue through which medicine produces its first impression in the cure of disease. The term first impression, is adopted under the belief, that all subsequent impressions are the result of that living relationship, subsisting between each and every portion of the same system. Under this view of the subject, it is with peculiar propriety that purgatives, the influence of which is more especially extended to

the secretory process of the liver, may be said to constitute the paramount remedy in the hands of the physician, for injuries done the scalp, cranium, and brain. The connexion between the stomach, liver and brain, is so intimate, that while mercurial purgatives prevent and cure a great many of the lighter forms of disease of the head, even the most aggravated are sensibly rendered more moderate by the use of the same remedies.

There has been for some time, and continues to be at present, a difference of opinion between some of the distinguished surgeons of France and England, on the propriety of healing certain wounds by the first intention; and although I could not appear as the unqualified advocate of the French practice, yet it seems to me that in its application to certain wounds of the integuments of the head, there will be found both science and safety. After amputations, the exsection of tumours, and of cancerous affections, the surgeons in France encourage the process of suppuration, under an impression that morbid humours are drained off by this discharge, which otherwise might remain in the system, and thereby protract disease. The correctness of healing wounds by the first intention, as a general principle, appears to be universally acknowledged in Great Britain and in the United States. It is however yet to be decided, if wounds of the scalp, accompanied by an injury done the parts beneath the skin, do not constitute an exception in practice. The common integument is more vascular, more sensitive, and enjoys in a higher degree the power of restoration, than those parts which it protects. In consequence of this vascularity of the skin, after contused and lacerated wounds, it is frequently observed to heal, while the parts over which it has united are still labouring under the consequences of the injury inflicted. In similar cases, even where no unpleasant consequences, in regard to a translation of morbid excitement to the dura mater ensues, it not unfrequently happens, as appears from some of the cases cited in this paper, that the pericranium and bone become diseased, thereby producing a train of symptoms always alarming, and too frequently fatal in their issue. Hence it happens that the present im-

proved condition of surgery, is justly chargeable with superinducing a particular form of disease of the pericranium, followed by a morbid condition of the cranium, dura mater and brain, which is never observed among wounds of the scalp which are suffered to suppurate, granulate, and cicatrise, according to this peculiar process of restoration. If then it be true, that a healthy granulating surface is always an indication of safety in reference to the condition of the brain, it would seem that one objection only can be urged against the practice of healing contused wounds by suppuration. Procrastination in the cure is experienced in all granulating surfaces; but notwithstanding the process is more tedious and troublesome, yet it should be preferred by reason of its safety.

Numerous cases are fresh in my recollection, and they occur every season, where chronic inflammation of the pericranium, with all its threatening train of evils, follows the union of the integuments by the first intention, in a contused wound on the scalp. Were the proposed alteration in practice to receive the sanction and support of the profession, it would not only place in greater safety all those who might be the subjects of slight injury done the integuments, but it would have the additional effect of preventing many cases of epilepsy, proceeding from wounds of the integuments accompanied by fracture and depression. The mobility of the scalp forbids a speedy and healthy re-union of divided parts; nor is a restoration to health, with a re-union of the skin, to be taken as evidence of a similar condition of the divided or bruised surfaces beneath the common integument, or to be relied on more than the occasional closing of the orifice of a fistulous abscess, can be received as evidence of the cure of this species of ulcer. A common bile on the scalp is known, after repeated suppurations, to be converted into an organized sarcoma, curable only by exsection.

When violence has been done the head, whether the integuments have been barely contused, lacerated, or divided by means of a sharp instrument; whether the cranium be fractured or escape all injury; whether there has been partial or severe concussion of the brain, certain leading principles in

practice demand especial attention. Inflammation, with a consequent call for the use of the trephine, is to be guarded against; and with this view before the professional attendant, rest, abstinence, and evacuations are strongly indicated. The class of evacuants which is selected in this case, cannot be a matter of indifference. On the contrary, it is in the particular discrimination of articles of the same class, that the practitioner is afforded the occasion of manifesting superior claims to professional skill. The more immediate connexions subsisting between the head, stomach and liver, under circumstances of the character above alluded to, make it necessary to place especial reliance on the virtues of antimonials and mercurials. Other evacuants possess the power of procrastinating, and sometimes of diverting entirely the usual course of morbid excitement; but none can be compared to these in the radical relief which they afford.

Evacuations under such circumstances are not only relied on for the purpose of discharging the contents of the stomach and bowels, but also to impress a healthy character on the secretions of the chylopoietic organs generally; since it is especially by the correction of the secretions, that the patient is placed in a state of safety. The impression of mercurials and antimonials is as decisive in correcting and curing many of those cases of morbid manifestations in the head, proceeding from injury done, as counter-irritants are in dispelling pain, when all the constitutional causes productive of it, have been removed by general remedies. The use of the lancet in cases of the description under consideration, is believed to be injudicious. The tendency of bleeding, is to prevent the development of symptoms consequent to injury done the head, by destroying for the time, a capacity in the system for re-action under the influence of causes calculated to excite inflammation. The removal of these causes is more especially limited to medicines which are capable, when administered in liberal doses, and under the direction of skill, of exerting an active influence on the morbid state of the organs of digestion. While the lancet is an invaluable agent in incipient or in progressive inflammation of the brain, it is an insecure palliative in cases

of a more moderate grade of action. Much the largest portion of alarming affections of the brain proceeding from violence, is to be found among those where the injury done is apparently slight, and in which the reaction of the digestive system upon the head occurs some days after. The active influence of mercurial and antimonial medicines, by preventing the torpor of the stomach and liver consequent to slight concussion of the brain, becomes the most powerful agent in preventing cerebral affections that are liable to ensue.

In regard to the management of those patients who have been the subject of the operation of the trephine, some difference of opinion exists among the surgeons; not so much, however, in relation to the constitutional treatment, as to the particular mode of dressing the wound. An English surgeon of Manchester is in the habit of closing the wound after the operation, with a view to union by the first intention, thus completing the cure in a few days.

The great variety in the character of injuries done to the head, would seem to forbid any perfectly uniform system of treatment being laid down after the use of the trephine. At all times however, it is desirable to render the suppurating surface as circumscribed as may be compatible with the patient's safety. In cases wherein there is no contusion such a practice is admissible; in all others, however, the process of suppuration is necessary to the cure. Surgeons are not prepared at all times when the operation is demanded, to appreciate the danger from the character of the wound. The most inconsiderable injury is sometimes followed by fatal consequences; while in other instances, extensive and shocking mutilations are sustained without ultimate prejudice. Two remarkable cases, among many others, have occurred in my practice, which are in point.

A man received a blow on the left side of his head, which fractured and depressed the parietal bone about the size of an English guinea. The fracture was comminuted, with contusion and laceration of the scalp. He was not knocked down by the blow, nor rendered in the slightest degree insensible from it.

The depressed bone was removed by instruments, and a branch of the arteria duræ matris which had been wounded, was secured. The proper dressings being now applied, and the patient presenting no unfavorable manifestation, it was thought he would be well in a few days. In the course of the evening of the operation, severe pain of the head ensued: this increased for six hours, and was then succeeded by epileptic convulsions, which destroyed him in thirty hours after the operation.

Mr. L. a brick-mason, received a blow on his head by a piece of timber, which fell from the third story of a house, while he was engaged in measuring his work. Being very near at hand, I reached the spot before the patient was removed, and found him rolling and twisting his body on the ground like an offended worm, with a depression in his scull which seemed sufficient to bury my fore arm in it. A line of depressed bone running from the lambdoid suture on the right, traversing the central part of the parietal bone, terminated in the two angular processes of the os frontis. The integuments were not injured. As soon as the patient could be taken to his lodging, preparations were made for the operation. An incision beginning over the eye-lid, was carried throughout the extent of the injury, and corresponding with the central line of depressed bone. In addition to this it was found necessary to make two transverse incisions. The detached bone was from one and a half to three inches in width, and this was transversely fractured one inch above the superciliary ridge.

The whole of the depressed bone was removed including the angular processes and orbitar plate of the os frontis. Considerable difficulty occurred in destroying the connexions between the superciliary ridge and the soft parts, and in dividing the pulley of the trochlearis muscle. On removing the whole of the bone, the first appearance which attracted attention was an extensive laceration of the dura mater, about half an inch above the orbit, from whence there escaped immediately not less than a wineglass-ful of brain. The pulse was at forty-five, with delirium. For the first twenty days there was scarcely any variation in the pulse, the delirium continued, and at

several successive dressings large portions of the brain were lost. The bowels were obstinately inclined to constipation, and every effort became necessary to preserve them sufficiently free. On the conclusion of the third week the pulse became natural in frequency and force, while the delirium subsided. The brain, which up to this period had been passive, suddenly presented a fungus of frightful magnitude at the defective points of the dura mater.

The difficulty of managing fungus cerebri had been often witnessed in the European hospitals, nor had success in treatment attached me to any plan of cure. Of all the remedies proposed in similar cases pressure had the preference, as being best calculated to prevent farther protrusion, and even to correct that which had occurred. It was necessary however to divest it of the objections which are urged against it by the highest authority. Efficient compression made suddenly upon the part cannot be borne, in consequence of the pain and apoplectic symptoms which are apt to follow. A knowledge of the capacity of the brain to accommodate itself to preternatural compression in apoplectic and other cases, suggested the advantages of gentle and regularly increasing pressure. With this view, dry sponge, bound directly on the protruding brain, by means of bandages applied not so close as to give pain, was suggested. A strong objection existed against the use of the cautery, the scalpel, the styptic wash, and the ligature, because of the tendency of all these to destroy the protruded portion of the organ. Dry sponge was therefore placed on the fungus, and bound as closely as the feelings of the patient would permit. By imbibing the secretions of the part, the pressure on the protruded brain regularly and insensibly increased, until the sponge became completely saturated. On the removal of this dressing, its decisive influence and superior efficacy remained no longer a matter of doubt, although it was difficult to remove the sponge, in consequence of its being extensively penetrated by blood-vessels originating on the surface of the brain. With a view to prevent this inconvenience in future, a fine piece of thin muslin was interposed. By the gradual and regularly increasing pressure of the sponge, I was enabled in the course

of a few days, without incommoding the patient, to replace a mass of protruded brain equal in magnitude to a small hen's egg; nor have I in any subsequent case, experienced any difficulty whatever, relying upon the same mode of treatment. Hitherto this symptom has been among the most fatal consequences of injuries done the brain and its investing membranes, while the attempts by pressure to correct the morbid protrusion have not succeeded. Gentle and regularly increasing pressure will not only replace the brain within the limits of the dura mater, but it will, when judiciously managed, make a deep impression on the brain beneath the common superficies without exciting unpleasant symptoms. By the use of dry sponge I have in five days cured the fungus cerebri, and produced a sinus below the dura mater equal in magnitude to the fungus, without exciting any alarming symptoms. When bound on too closely, the pain thereby produced occasions the necessity of relaxing the bandages, sometimes in a few minutes after the application. When the sponge is completely saturated by the secretions of the brain, its pressure is probably treble what it was when first laid on; and yet there is no increase in the inconvenience from the dressing.

At the end of two months the patient was so perfectly restored, as to resume his station on the scaffold of the brick-mason. After the loss of so large a portion of brain, amounting it was thought to the major part of the anterior lobe of the cerebrum, the patient gave manifest evidences to his acquaintances on his recovery, of an increase of intellect. For several years his propensity for good natured argument, and the ingenuity displayed in the support of his positions, was matter of observation among his friends. At last he became the subject of epileptic convulsions, and now, thirteen years since the accident, he is nearly deprived of memory.

The extent of danger in wounds of the head is not to be estimated so much by the manifest injury done, as by the particular state of the pulse. Where the pulse is preternaturally frequent and excited, however slight the injury may appear, strong doubts may be entertained about the issue of the case; on the contrary where it is beneath the healthy standard in fre-

quency, however extensive the injury done to the brain, the indication is flattering for a successful termination.

ART. II.—*Thoughts on the Circulation of the Blood.* By CHARLES CALDWELL, M. D. Professor of the Institutes of Medicine and Clinical Practice, in Transylvania University.

THE blood, in its passage, in warm-blooded animals, from the commencement of the aorta back to the same point, performs what is denominated a *double* circulation. Of these, one is *long*, extending through the whole range of vessels that lead from the left to the right side of the heart, and is called the *systemic;* the other *short*, reaching only through the lungs, from the right side of the heart to the left, and is called the *pulmonic.*

The machinery, and the powers employed in propelling the blood around each of these large segments of circles are the same. An explanation, therefore, of one of the courses of circulation will serve for both. We shall select the *systemic.*

In performing this circuit, the blood passes through three different orders of vessels, the *arteries*, the *capillaries*, and the *veins*, in each of which its movement is effected by different powers.

As respects the principles of the *arterial* and *capillary* circulation, *enlightened* physiologists, of the present period, do not materially differ in sentiment. But in relation to the *venous*, the case is otherwise. On that point, opinion is as varied and unsettled now, as it was two hundred years ago.

To the phenomena and causes of the *latter* circulation, then, our attention, in this memoir, shall be chiefly directed. Of the two *former*, we shall speak so far only, as they may have a bearing on our views with regard to the other.

Between the three orders of vessels above designated, no accurate lines of demarcation have been hitherto drawn. Nor shall we attempt to draw them, on the present occasion, as they

are not essential to the object we have in view. We shall only observe, that, by arteries and veins, we mean vessels of some size, whose office is simply to carry blood *from* and *to* the heart, without producing in it, by their peculiar action, any manifest change either of appearance or quality. Their functions are *circulatory*, and perhaps nothing more.

Capillaries, on the contrary, as their name imports, are vessels of a much smaller size, whose function is not only to *carry* blood, but to *change* its properties, by modes of action peculiar to themselves. This action is specifically different in different organs.

It is chiefly in the *systemic* capillaries, or those concerned in the *long* circulation, that the blood is rendered tributary to secretion and nutrition, and converted from arterial into venous; while, in the *pulmonic* capillaries, or those making a part of the *short* circulation, it is reconverted from venous into arterial, and supplied afresh with that amount of the vital principle, of which it had been deprived in its systemic course.

The aggregate capacity or extent of caliber, of the *small* arteries, is much greater than that of the *aorta;* and the same is true of the capacity of the small veins, compared to that of the *Vena Cava.*

Considered, then, in relation to the extent of their cavities or hollow contents, the arteries and veins resemble two cones, their apices lying in contact with the heart. These cones rest their bases on the capillaries, which lie between them, and in the aggregate of their caliber, exceed either.

In the systemic circulation, the arterial blood runs from the apex of the cone to its base; while the venous flows from the base to the apex. In the pulmonic, this order of movement is reversed; the *venous* blood passing from the apex to the base of the pulmonary artery, and the *arterial* from the base to the apex of the pulmonary veins. Here, again, as in the systemic structure, the bases of the two cones are separated by the capillaries, which surpass them in capacity, and on which they may be said to rest.

In effecting the *arterial* and the *venous* circulation, the heart appears to be alike instrumental, but on opposite principles. In

the *former*, it acts, with its *left* ventricle, the part of a *forcing-pump*, and, in the latter, with its *right*, as we shall endeavour to show, it acts by *suction*.

That in the arterial circulation, the left, or systemic heart serves, by its propulsive power, as the chief instrument of motion, cannot be doubted. The arteries, however, are not only well adapted conduits, but by their *tonicity* or uniform *tendency* to contract, perform the part of auxiliaries, in the process. But they do not, as they are generally believed to do, *actually* contract and dilate, in unison with the systole and diastole of the heart. Unless contracted or dilated artificially, or by disease, their caliber does not alter in its width.* On each con-

*When the subject is deliberately and fairly examined, it is found that there exists no shadow of reason why the arteries should thus expand and contract. On the contrary, every reason that presents itself forbids a belief in such a state of action.

From the left to the right side of the heart, the blood moves in an unbroken column—a column perfectly uniform, unless it be interrupted by some accidental occurrence.

When, by contracting, the left ventricle projects a given amount of blood into the aorta, the right auricle, expanding at the same instant, draws from the vena cava an equal quantity. Hence the uniform integrity of the column between the two sides of the heart is maintained.

If the aorta and its branches must expand, because the left ventricle throws a small quantity of blood into them, the vena cava and its branches must, at the same instant, contract, because the right auricle draws an equal quantity of blood from them.

A priori, then, there seems to be as much and as solid ground to believe in the alternate dilatation and contraction of the venous, as of the arterial system.

But accurate observation, the only perfect and unexceptionable test of truth in the inquiry, assures us, that, in a healthy and unobstructed condition, neither of them dilates and contracts.

A systole and diastole in either is abnormal, and makes no part of the unperverted movement of health.

Independently of all other considerations, the contractile force of the left ventricle of the heart is not sufficiently great to produce a mechanical dilatation of the thick, strong, and resisting parietes of the aorta and its innumerable branches. For, notwithstanding the elasticity of those parietes, to dilate, by a single effort, the entire extent of the arterial system, requires not only much more of power than is generally imagined, but much more than the left ventricle of the heart possesses.

But, I repeat, that my knowledge of this subject rests on a basis much more substantial than than of abstract reasoning. It rests on observation.

traction of the left ventricle of the heart, they manifest a propulsion, or forward motion, but nothing more. What we call the pulse is the result of pressure made by the finger. The pressure narrows the diameter of the artery at the point of compression; and the column of blood projected from the heart, too large to pass without collision the strait thus created, strikes, in its efforts to dilate it, against the finger with a force that is felt.

Impede, in any part, the free movements of the arterial blood, the action of the heart being vigorous, and a pulsation is felt in the place of obstruction. The throbbing experienced in topical inflammation, is at once an illustration and a proof of this. So, in the stage of excitement of intermitting fever, where there is no actual inflammation, is the throbbing of the arteries that run to the brain. In either case, remove congestion and obstruction, and the throbbing is gone.

At the termination of the arteries, the influence of the heart ceasing to be felt, the capillaries are left to carry on their circulation by their own action. That this is true, appears from many phenomena that might be mentioned.

Divide capillaries, and the blood never flows *per saltum*, nor in a forcible and continued jet, as it does on the division of the smallest arteries.

Blushing is produced by an action of the capillaries independent of the immediate action of the heart. So are the effects of rubefacients and epispastics, when applied to the skin. Nor must we say less of secretion, both healthy and morbid,

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Having repeatedly laid bare the carotid arteries of calves and sheep, while the animals were living, I assert unhesitatingly, that, neither to myself nor my assistants, did those vessels exhibit the slightest dilatation or contraction. At each contraction of the left ventricle, they manifested, as already mentioned, a propulsive movement toward their termination in the brain, but nothing further.

When it shall have been proved to my satisfaction, that, in these experiments, my senses deceived me, I shall resign my belief—not otherwise.

I shall only add, that, in making these experiments, care must be taken to keep the arteries under examination perfectly straight. If, by the struggling of the animals, they be suffered to become bent, the propulsive movement, at the place of flexure, may be mistaken for an expansion.

nutrition, granulation, cicatrization, and many of the phenomena of the gravid uterus.

The very fact, that the capillaries perform on and with the blood, a variety of functions important in themselves and essential to the body, is itself satisfactory proof, that that fluid is not forcibly and rapidly driven through them by the influence of the heart; but that it circulates by virtue of their own action. Hurry it along by an extraneous power, and their functions performed on it, and by means of it, will be necessarily prevented.

The blood moves through the capillaries much more slowly than it does through the arteries and veins, in like manner as the water of a lake, formed by a river, moves more slowly than that of the river before it enters the lake, and after it leaves it. Hence the impetus with which the blood moves at the termination of the capillaries and the commencement of the veins is inconsiderable. We are, therefore, compelled to believe, that the venous blood is but very slightly, if at all, indebted to a *vis a tergo*, for its motion towards the heart.

To what power, then, is this motion to be attributed? and whence is that power derived? These interrogatories constitute the topic which we now propose to consider. But previously to the delivery of our own opinion on it, it is requisite that we call into review some of the opinions of others.

On those hypotheses which assign the circulation of the venous blood to the influence of arterial concussion, and muscular compression, we shall not dwell. However popular they may once have been, and however distinguished the names on whose authority they rested, they do not possess a sufficient amount of weight or plausibility, to render them worthy of serious discussion. A moment of deliberate examination and reflection ought to convince of their entire fallacy every individual correctly informed of the structure and functions of the human body. The same may be said with equal truth of a certain fancied vibratory motion of the veins.

But, on the subject of the circulation of the venous blood. there exists, at present, another hypothesis, which has been ushered into the world in a manner so positive, with an aspect

so imposing, and under the sanction of authority so elevated, that a becoming attention to it would seem to be indispensable. For when, in the interpretation of nature, reiterated experiment is made to lift her oracular voice, to listen and ponder becomes a duty. And this duty is rendered the more imperative, when the experiments derive additional weight from the circumstances under which they are made and announced to the world.

On the 8th of June 1825, before the Academy of Sciences, at the Institute of France, was read by David Barry, M. D. a Memoir, "On the motion of the blood in the veins," the object of which, in the language of the author, was "to demonstrate, by proofs drawn from the structure of animals, and from direct experiment,

"First. The powers by which the blood is propelled through the veins to the heart.

"Secondly. The comparative velocity with which it is moved through the veins, and through the arteries.

"Thirdly. That the constant supply of the blood to the heart, cannot depend solely upon the causes to which it has been hitherto ascribed."

Such is the tone of entire confidence, with which Dr. Barry announces the object and character of his Memoir. Nor does he fail, in his brief preliminary remarks, to speak very lightly, and in terms of intentional and strong disparagement, of all opinions at variance with his own. He does not respectfully oppose and reason. He deems it more convenient, probably because he finds it easier, to condemn and denounce.

His language, in condemnation of one theory entertained on the subject, we shall quote, as a specimen of his manner towards those who differ from him in sentiment.

"The supposition that the cavities of the heart possess the power of dilating themselves, and, therefore, of acting alternately as suction and forcing-pumps, although adopted by some existing physiologists, has hitherto derived but little support, either from anatomy or experiment. This opinion was too trite, even in the days of Harvey, to merit serious refutation. Neither the auricle nor the ventricle appears to be furnished

with any intelligible muscular apparatus, by which either can accomplish its own dilatation. Every thing we find in them, seems evidently calculated to favour their contraction."

Such is the only mode in which Dr. Barry condescends to discuss opinions which he considers erroneous. With him, his own sentiment is truth, and his own dictum, argument.

Like ourselves, Dr. Barry disbelieves in the competency of arterial concussion, muscular compression, and capillary contraction, to produce venous circulation, or even to act as valuable auxiliaries in it. And he extends a similar disbelief to the competency of the "veins themselves, acting upon their contents."

Without going into a specification of the experiments of Dr. Barry, on which he relies for the support of his opinion, it will be sufficient for our purpose to state distinctly what that opinion is.

As far as we have been able to make ourselves master of his precise meaning, the Doctor's hypothesis is, that *respiration* and *atmospherical pressure* constitute the sole cause of the return of the venous blood, in the systemic circulation, to the right side of the heart, and, in the pulmonic, to the left.

He believes, that, by the act of *inspiration*, a *vacuum*, or a *tendency* towards it, is produced in the thorax, around the *vena cava* and the *pulmonary veins*, where they unite with the right and left auricles, and that, by the pressure of the atmosphere, the venous blood is thrown into this vacuum, with an impetus sufficient to force its way into the heart, which *relaxes*, but does not *open*, to receive it. The venous blood arrives, therefore, at the right and left sides of the heart, *only during the time of inspiration.* But, as the individual inspires less frequently than his heart contracts, in the ratio of about *one* to *seven*, our author further believes, that the great veins within the thorax, are so constructed and arranged, as to form reservoirs sufficiently capacious to hold as much blood as passes through the heart, "during a whole act of respiration."

That we may neither misrepresent nor obscure his meaning, we shall give it in his own words.

"But as the aorta, the great discharging pipe of the heart, is equally employed, during both stages of respiration, in sending blood out of the thorax, it seemed probable, that enough of blood should be brought into the chest, during its expansion alone, to supply the discharging tubes during a whole act of respiration."

In his own view of things, our author ascertained that this superabundant amount of blood is brought into the thorax; and, by an anatomical inspection of the parts, discovered the reservoirs in which it is deposited. His statement virtually is, that there exist, at the right and left sides of the heart, two venous reservoirs, each sufficiently capacious to hold as much blood (and no more) as is discharged through the pulmonary artery and the aorta, at about seven contractions of the ventricles. Should inspiration be suspended beyond the time of this number of contractions, there will be no venous blood for transmission through the heart and lungs; and the pulse will necessarily cease to be felt. The heart may still contract and expand, but it will discharge no blood from its left ventricle, because it will receive none into its right auricle.

In further evidence that we state correctly our author's sentiments, we shall quote again, in his own words, what he denominates his

"CONCLUSIONS."

"From what has been said, and from what has been observed in the experiments, the two following facts may be considered proved.

"*First.*—That the cavities of the great veins within the thorax, and all the thoracic cavities, draw towards them the fluids with which they are placed in direct communication.

"*Second.*—That this attraction, or suction, never takes place, but during the expansion of the thorax, that is, during inspiration.

"From these facts, and from what we have seen in the last experiment, we may conclude—

"1st. That the blood which runs contrary to its own gravity, arrives at the heart only during inspiration.

"2dly. That the power which impels it at this moment through the veins, is atmospheric pressure.

"3dly. That as this power can be applied to the blood of the veins only at the moment of inspiration, this blood must move with a velocity which is to that of the blood moving through the arteries, as the time occupied by a whole respiration is to the time occupied by a single inspiration.

"4thly. As the blood passes through the greater veins during inspiration only," &c.

From these extracts it clearly appears, that the hypothesis of Dr. Barry is, that respiration is essential to the motion of the venous blood; that it produces this motion by the formation of a vacuum within the cavity of the thorax; that the venous blood, instead of being regular, is intermittent in its movement; but that, when in motion, it flows with nearly twice the velocity of the arterial blood; and that if you suspend respiration, you arrest the motion of the venous blood, and, of course, circulation generally; because, if venous blood does not flow *to* the heart, there will be no arterial blood to flow *from* it.

That this hypothesis is entirely unfounded, appears from considerations which we shall proceed to detail; and which, if we are not greatly mistaken, amount to arguments that cannot be resisted.

Of the experiments performed by Dr. Barry, in support of his sentiments, our notice shall be brief. Our object, we think, might be fairly attained, without the slightest reference to them; for we do not perceive that they have any immediate bearing on the subject. Certainly they have no bearing of force, as we hope to make satisfactorily appear.

Like most other experiments denominated physiological, they so completely mutilated the systems of the animals on which they were performed, and so far altered their conditions, and perverted their powers and modes of action, as to render it unsafe to draw from them any conclusions touching the natural functions of the same animals, when entire, and in a state of health.

We regret to say that this is the case with nearly the whole host of experiments, as far as we are informed of them, that

are now going on so extensively and unremittingly, for the purpose, as we are told, of throwing light on the healthy functions of the animal body. By means of those experiments, the animals, that are the subjects of them, are, in some way mutilated, deprived of their natural powers and susceptibilities, submitted to torture, and thrown into a paroxysm of the most acute disease and suffering, and the phenomena which they exhibit, when in this condition, are received as healthful, and denominated natural!

As respects the experiments reported by Dr. Barry, this representation is literally true. In each of them, a direct and preternatural opening from without was made into some important internal and close cavity of the body, which changed most essentially the relation between the animal and external nature, and, of course, the action growing out of that relation.

In one instance this opening was made into the cavity of the heart, through the jugular vein; in another, into both cavities of the thorax, through the surrounding parietes; and, in a third, into the cavity of the pericardium itself.

But under the infliction of such painful injuries, and the production of such imperfection of important organs, it is not possible that the functions can be natural. Hence, from none of the experiments performed by Dr. Barry, can any conclusive inferences be drawn, in relation to the cause of venous circulation.

Indeed with regard to the merits of the aggregate of what are undeservedly called physiological experiments, which have, of late, been so abundantly performed both in Europe and America, we are not a little inclined to concur in sentiment with Charles Bell, when he declares, that "Experiments have never been the means of discovery; and that a survey of what has been attempted of late years in physiology, will prove that the opening of living animals has done more to perpetuate error, than to confirm the just views taken from the study of anatomy and natural motions."

Whether this sentence of unqualified condemnation be just or not, in its full extent, it is certainly true, that observation on the processes of nature, unshackled and undisturbed, is not only

the best, but the only mode of learning what those processes are, and how they are performed.

Hence anatomy, astronomy, natural philosophy, mineralogy, and natural history, are much more of exact sciences, than physiology or chemistry. The reason is obvious. The former are founded on observation, while of the latter, chemistry rests entirely on experiment, and attempts are making to place physiology on the same basis.

Could this be done without altering, in any way, the condition of animals, it might eventuate in good. But experiments that do violence to the regular course and order of things, make nature speak a false language; while faithful observation interprets her correctly. As far as physiology is permitted to rest on such observation, it is equally exact and solid with other branches of natural science.

Experiments, then, that do no violence to nature, are useful; those which are the reverse of this, never fail to prove injurious.

But, be the abstract merit of Dr. Barry's experiments what it may, his "CONCLUSIONS" derived from them are certainly erroneous.

That far from being more, the motion of the venous blood is much less rapid than that of the arterial, is a truth of which the veriest tyro in medicine can scarcely be ignorant. Nor is it true that the venous circulation is intermittent, otherwise blood would flow from a divided vein *per saltum*, precisely as it does from a divided artery.

That a vacuum produced in the cavity of the thorax by inspiration, is not the cause of venous circulation, nor in any degree essential to it, appears, we think, conclusively from the following considerations.

In fish, no vacuum is produced by respiration, in the thorax, around the heart and large blood-vessels, which are there situated. They possess, indeed, no structure or arrangement, by which such a vacuum can be produced. Yet, in them, venous circulation goes on as regularly as it does in horses and dogs, the animals on which Dr. Barry experimented.

In respiration, fish simply pass water through their bronchiæ or gills, by a kind of motion which has no immediate influence on the heart, or any of its appendages. They receive the water, by the mouth, as if they were about to swallow it, and discharge it by the gills, without producing in the cavity containing the heart and large veins, the slightest affection.

Indeed the entire process of the circulation of the blood in fish, is in direct opposition to the hypothesis of Dr. Barry. With a view to the establishment of this point, we shall again quote from our author's Memoir.

"Later physiologists have done but little to show either the truth or the error of Harvey's assertions. They have merely admitted a few secondary sources of impulse to the blood, such as—1. The contractile power of the arteries—2. The insensible contraction of the capillaries—3. The action of the veins themselves upon their contents."

Now, to one or the other of those powers, or to all of them united, the long circulation in fish must be attributed, because it is subject to no other influence.

The heart, which is single, is so situated, that it effects, by its action, only the short circulation through the gills. In passing through the capillaries of the gills, the blood loses entirely the impulse it had received from the heart. In confirmation of this, no pulsation can be felt in the aorta, into which the blood from the bronchiæ flows. Nor is the blood again subjected to the action of the heart, until it has performed its long circuit, and arrived at that organ through the vena cava, to be again projected into the bronchial artery.

By the action, then, of the arteries and veins, without any impulsive aid from the heart, or suction from a vacuum formed by inspiration, is the blood propelled through the long circulation.

Dr. Barry has been too limited in the range of his observations and experiments, to settle a great question in physiology. We suspect that he is no naturalist; in which case his physiological attainments must necessarily be moderate. Without an extensive knowledge of organized nature no one can be a physiologist.

In the performance of its kindred and corresponding functions, all living matter observes a close and settled analogy. It is constructed on the same model, and acts on the same principles. Similar functions are performed, very generally, by similar means. On this ground much light may, in many instances, be drawn from the vegetable kingdom, to illustrate the actions performed by the animal. Nor does the subject of our present inquiry offer an exception to this rule.

If the sap-juice of vegetables does not actually circulate, it as certainly flows through vessels, as does the blood of animals.

On what principle, then, does it flow? There exists no heart to give it motion; nor will any one pretend that for that purpose a vacuum is formed. Vegetables indeed respire, and derive their vital principle from the atmosphere. But they do not perform that process by the expansion and contraction of any cavity, into which the sap-juice is to be propelled by atmospherical pressure. That fluid moves by the proper action of the vessels that contain it. This, as far as we are informed, is now the confirmed opinion of all physiologists. Nor, to say the least, do the sap-vessels of vegetables appear to be better calculated for specific action than the veins of animals. On the contrary, no one will hesitate to pronounce their fitness for such action greatly inferior. All analogy is favourable to a belief in the propulsive action of veins; nor does any thing in the structure or appearance of those vessels forbid it. The correctness of this opinion will more fully appear hereafter.

But without descending to the vegetable, or even quitting the sphere of the highest orders of the animal kingdom, we have proof satisfactory of the fallacy of the hypothesis, against which we are contending.

According to that hypothesis, as already stated, if respiration be suspended beyond the period of seven contractions of the heart, the pulse must fail, for want of the arrival of venous blood at the right side of that organ. But that this is not the case, every one can convince himself, by the following experiment, in less than a minute.

Having first expired, suspend inspiration, and count the pulse, which is tantamount to counting the contractions of the heart. Without any difficulty, this suspension can be maintained, until from forty to fifty beats shall have been felt; and no change will be perceptible either in their frequency or force. We have made this experiment often, and, in relation to ourselves, affirm the issue here stated to be true. We have also made it on others with the same result.

Again. Inspire, and count. In this case expiration can be suspended, until the pulse shall have beaten from seventy to eighty times; and neither in its force nor frequency will any perceptible alteration have occurred—or if at all perceptible, not more so than it always is, when, from any other cause, the condition of the system is materially changed.

In their search after coral and pearl, trained and expert divers remain under water several minutes, their respiration, of course, suspended all the time. Yet during this protracted submersion, their pulse beats, and their blood circulates as usual.

As an evidence that "irritability survives respiration," Dr. Cheyne tells us, that "sitting with his finger over the artery of a person, who died of apoplexy, he distinctly felt the pulse beat after the last expiration."

We are authorized by professor Dudley to state, than in a case of death from apoplexy, he felt distinctly the beats of the carotid arteries at least an hour and a half after the patient had ceased to respire.*

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*In confirmation of this statement, the following note was received from Dr. Dudley:

"A negro man about twenty one years of age, while engaged in gathering hemp, was observed by his brother to be in the act of falling, and before assistance could be afforded him he fell, and was not observed to breathe afterwards. He was immediately taken up and carried to the house, and a servant was sent to procure a horse and ride to town for me.

In about three quarters of an hour after the patient fell in the field, I arrived and found him laid out in the usual state of a corpse.

The pulsation in the carotid was as distinct on my arrival, and continued for near an hour after, to the period of my leaving him, as I am accustomed to distinguish it in the radial artery. By considerable pressure I caused the

Whales, when in health, and pursuing their gambols through the ocean, do not, we believe, respire oftener than once in twelve or fifteen minutes. We never measured the period accurately when observing their frolics, but know it to be considerable. When wounded with the harpoon, they often plunge deep into the ocean, and remain under water a much longer time. Yet, in each case, the circulation of their blood goes on.

Similar remarks are equally applicable to frogs, alligators, and other amphibious animals. They remain long under water, without a suspension of the circulation of the blood. These facts are established and notorious. Nor is it possible to interpret them in any other way than in direct opposition to Dr. Parry's hypothesis.

The siren, a truly amphibious animal, is so constructed and endowed, that, when submersed, it breathes water with its gills, and, when in the atmosphere, breathes air with its lungs. These two processes are performed by movements entirely different, the thorax of the animal being expanded during the one, and not during the other. Yet in each the circulation of the blood is maintained. And maintained perfectly, the animal being able to subsist with equal facility and comfort, and for an equal length of time, in air and in water.

But we have not yet exhausted our store of objections.

In the fœtus in utero the blood circulates freely and rapidly, for many months, without respiration. How will Dr. Barry, on the principles of his hypothesis, account for this? We merely ask the question, and leave to him and his followers, if he has any, to furnish an answer.

The placenta, which performs the office of lungs to the fœtus, neither contracts nor expands. Nor can it be alleged that the respiration of the mother has any influence on the fœtal circulation. That circulation goes on freely after the death of the mother. Between the maternal and the fœtal blood-vessels there is no direct connexion. In no point does inoscu-

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pulsation to stop, and could observe distinctly its progressive return from the inferior to the superior portion of the vessel. This experiment was repeatedly performed during my stay with the patient."

lation between them exist. Hence the circulation of the mother and that of the fœtus are processes perfectly distinct, and independent of each other. Each is exclusively under the influence of its own appropriate organs. The truth of this entire statement is further corroborated, by the well known difference in the frequency of the maternal and fœtal pulses; as also by the difference of the maternal from the fœtal blood.

In fact, respiration has no more of a direct influence on fœtal circulation, or any other kind of circulation, than it has on the secretion of bile, saliva, or pancreatic liquor.

But Dr. Barry has said, "that the blood which runs contrary to its own gravity, arrives at the heart only during inspiration."

Does he mean by this to insinuate that the blood, in the upper and lower parts of the body, circulates by different powers? Are we to understand his opinion to be, that the blood from the head circulates by its own gravity, and that from the feet against its gravity, by means of a vacuum, and the pressure of the atmosphere? If such be his meaning, the error is too palpable to deserve refutation. And if it be not, we have to regret our inability to interpret his words.

That gravitation has an influence on the circulation of the blood, will not be denied. Hence when the arm hangs, the veins in the hand become distended with blood; and empty themselves again, as soon as the arm is raised and directed upwards. But it is no less true, that when the body is erect, and respiration suspended, the blood flows to the heart from the lower extremities, as well as from the upper. Were not this the case, the veins of the feet and legs would swell during the experiment. But they do not. They swell during the suspension of respiration, no more than they do when it is not suspended.

Were it true that the blood arrives at the heart only during respiration, the suspension of that process would immediately and certainly check arterial hemorrhagy. It would check active hemorrhagy of every description.

In that case, only suspend respiration, and you may divide the carotids, and even the aorta itself, and the animal thus mutilated will not bleed to death.

But that this opinion is as unfounded, as it appears improbable and wild, is definitively proved by the following experiment.

Two puppies of the same litter, and apparently equal in strength and vivacity, were thus treated.

Both carotid arteries of each were laid bare, and then divided at the same instant, respiration being suspended in one, and left free in the other. The result was, that from each, the blood flowed in the same abundance, and they died at the same time. In the phenomena exhibited, the only material difference was, that the blood discharged by the animal, whose respiration was free, was arterial in colour, while that discharged by the other was venous.

In favour of his hypothesis Dr. Barry alleges, as arguments, two further considerations which we feel bound to notice. We shall again exhibit his sentiments in his own words.

"Having once caught this view of the part which respiration might probably bear in circulation, particularly of the venous blood, several known facts presented themselves in support of its correctness, viz. the swelling of the external jugular veins during expiration, and their collapse upon inspiration. The checking of certain hemorrhages by forced inspirations."

It is not without great reluctance that we deny or question the correctness of facts, when stated as the result of personal observation; more especially those facts, in the ascertainment of whose truth there can be no difficulty; and respecting which there should be no difference of opinion.

In the present instance, however, we are compelled to deny the accuracy of our author's statement respecting the external jugular veins. Those vessels do not regularly swell on expiration, and collapse on inspiration. For evidence of the truth of thi sassertion, we refer to that kind of observation to which every one is competent, a careful inspection of the jugulars during respiration. We have repeatedly made the experiment, and confidently assert, that, having forcibly expired, we have forborn to inspire, until we had counted forty beats of our pulse; during which time no swelling of our jugulars was perceptible. On others we have had the same experiment made, with

the same result.* Nor do we know of a hemorrhagy which "forced inspiration" will check. If any such exist, the fact has escaped us; and nothing but a knowledge of it derived from observation, or the most authentic information of the circumstances of the case, can induce us to credit it.

The last argument we shall offer in opposition to Dr. Barry's hypothesis is, that it is too mechanical. Instead of a living, it makes man as real a hydraulic machine, as either a fire-engine, or a water-pump. It places mere mechanism above life, by giving to the former, in point of efficiency, a decided superiority.

True physiology, on the contrary, regards the human body as a specimen of workmanship, in which mechanical structure is placed in entire subordination to vitality. It gives to every organ of the system some vital and specific action of its own; and out of the harmonious aggregate of this action, arises what is denominated the animal economy.

Thus considered, the whole body of man presents a specimen of exquisite organization and endowment, worthy of the conception and execution of a God. But, considered on the principle of Dr. Barry's hypothesis, that portion of it which is concerned in venous circulation, may be imitated and equalled by an ordinary mechanic. A pair of bellows and a few elastic tubes will constitute the only elements of the machinery. These being arranged and put together, a puff of wind will set all in motion, the superincumbent atmosphere will lend its pressure, and the *living* workmanship of the LIVING GOD will be thus represented! And all this will be effected by feeble man, operating on a collection of dead matter!

If lunacy itself has ever erected a castle in the skies more perfectly air-wove and perishable than this, we are ignorant of the time and place of the achievement.

The attempt of mechanists and chemists to usurp the place and power of the vitalists, and to substitute the laws of dead for those of living matter, in explanation of the functions of

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* When females are singing, or conversing with animation, their external jugulars are sometimes seen to swell. But this is the effect, not of a want of inspiration, but of the forcible and irregular action of the muscles of the neck.

the animal body, has been the bane of physiology in all ages. And we are sorry that Dr. Barry has so decidedly thrown his weight into the scale of the conspiracy.

Suppose a vitalist were to enter the laboratory of a chemist, or the workshop of a mechanist, and say to either of the incumbents and operators, while pursuing his vocation, "This process in which you are engaged, or this machine you are constructing, depends for its accomplishment, on organic sensibility and insensible organic contraction; that, on sensible organic contraction; a third, on animal sensibility; and a fourth, on animal contractility, or the power of locomotion and voice."

Suppose, we say, a mechanist or a chemist were thus addressed; what would be his sentiments of the vitalist addressing him? The answer is plain. He would commisserate him as being deranged; smile at him, as in jest; or resent his conduct, as intending an insult.

What, then, must the vitalist think of the mechanist and the chemist, who attempt to foist into a system of laws, which God has established for the performance and governance of living functions, the principles of the sciences to which they are themselves devoted? principles instituted and intended by nature for the government of dead matter alone? The question is proposed, to be answered by our opponents, on their responsibility to future ages, when a brighter day shall have opened on medicine, and every other branch of human knowledge.

According to the plan proposed in the commencement of this memoir, it would now be in order for us to proceed to the consideration of those powers, by which the venous circulation is performed. But the article having already extended not a little beyond its contemplated bounds, that discussion must be deferred, until a future occasion.

ART. III.—*An Essay on the Theory of Fever.* By JOHN ESTEN COOKE, M. D. Professor of the Theory and Practice of Medicine in Transylvania University.

Felix qui potuit rerum cognoscere causas.

MANKIND have ever shown a strong inclination to discover the causes of natural phenomena; and from the remotest ages their ingenuity has been exercised in the investigation of the secrets of nature.

The inquiry into the origin and nature of the various forms of disease which afflict the human race is particularly interesting, seeing that the natural propensity is stimulated by the importance of the subject to our well-being, and to life itself. Physicians, who are continually called on to relieve the afflicted, and whose best endeavours in their behalf are often baffled, are especially interested in ascertaining the causes of the morbid appearances, and particularly the proximate cause, "quæ præsens morbum facit, sublata tollit, mutata mutat."*

They have accordingly shown, from the earliest times of which we have any record, the deep interest they feel in this subject. By their unwearied attention, and by a multitude of observations, they had early made considerable discoveries respecting those causes which remotely influence the body in such a manner that disease is eventually produced; they had marked the phenomena that occur, and had laid down, with considerable precision, those which indicate a favourable or an unfavourable termination; and they had acquired a knowledge of many articles, vegetable and mineral, of great efficacy in the treatment of diseases.

The intermediate causes however, connecting links between the remote causes and the symptoms of disease, and particularly the proximate cause, escaped them entirely. Consisting in

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*Which when present causes the disease, when taken away takes it away, when changed changes it.

changes wrought in the body by the remote causes, they are not subject to observation; and the only course by which to acquire a knowledge of them, is that of rigid inference from known facts, and of argument built on those facts and inferences. Yielding however, to the impatient desire, natural to man, at once to solve every difficulty, this slow but sure course was deserted; and medical writers had recourse to conjecture, and formed such hypotheses as they deemed consistent with known facts, and sufficient to explain the phenomena.

Physicians in succeeding ages have too closely followed the example. Although they have multiplied their experiments and observations, and have in the course of ages accumulated an immense number of facts, and made many efforts to explain the phenomena of disease, it is thought little progress has been made; and a writer of some distinction says, "The real derangement in the system which produces the external appearances in fever, it must be owned, is not at all known."[1]

The theories of the moderns, like those of the ancients, are founded on hypothesis or conjecture, and therefore have uniformly failed to give general satisfaction, for any length of time, in an age in which the Newtonian method of philosophizing has enlightened the mind of the public. Hence has arisen in some, a kind of despair of ever seeing any satisfactory explanation of the phenomena of disease, and in others a contempt of all theory. It is however unmanly to sit down in despair of ever discovering the true theory of the operation of the causes of diseases, and of the remedies which remove them; and it is folly to despise the truth. It is unquestionable that if we were acquainted with the successive changes which take place in the system, while under the influence of the remote causes of disease, we might direct our efforts with greater advantage to break the chain of causes which often issue in death. The explanation of the manner in which these successive changes are produced, or a statement of the immediate effects of the remote causes on the system, and of the changes wrought in it in consequence of these effects, will show the whole connexion

1 Fordyce on Fever, Dissertation 1, p. 47.

between the agents ascertained to be remote causes of disease, and their effects the symptoms, and is the true theory.

The course which, it is believed, this investigation must necessarily take in order to be successful, is stated in a few observations which follow.

Every phenomenon is the effect of some cause producing it; that cause was likewise produced by a second; that by a third; and so on extending upwards in point of time of existence.

This succession of cause and effect constitutes a chain of causes, or of effects, according as it is viewed in the ascending or in the descending line.

Each phenomenon is therefore, at the time of its appearance, the termination or last link of a chain of causes.

That link of such a chain which is nearest to the phenomenon observed, which immediately produces it, is the proximate cause: those links more remote from the phenomenon, are called its remote causes.

The proximate cause, as well as every other link of the chain below the remote cause of all, is therefore an effect of the remote cause.

Different effects may flow from one remote cause. In this case, the chain of causes ascending from each effect, must terminate in that remote cause from which they all proceed. These chains of causes may not all continue distinct until they arrive at the remote cause, but may fall into one another, as they ascend, before they arrive at it. Thus a remote cause may produce a single effect, which may be the cause of another single effect, from which several effects may directly or indirectly proceed.

Different remote causes may produce the same effects; and we often find them co-operating to produce them. In this case it is plain that the descending chains from, the different remote causes coincide at some point as they proceed downwards, and co-operate in producing some link of the chain. That link must be one from which all the effects proceed; otherwise, the remote causes, which co-operate to produce it, would be the remote causes of only a part of the effects.

Applying these manifest truths and inferences from them to the phenomena of disease, the remote causes of fever, and the whole train of symptoms proceeding from them, denominated a febrile paroxysm, with all the intermediate links, constitute a series of causes and effects; the chains of effects descending from all the remote causes uniting in each symptom, and the chains of causes ascending from all the symptoms uniting in each remote cause. Every effect of the remote causes is one point of the series, one link of the chain; is the effect of the causes preceding; is the cause of the effects succeeding.

Hence it is evident that, in order thoroughly to investigate *the connexion between the remote causes and the symptoms of fever*, we may inquire into the effects of the causes ascertained; next into the effects of those effects, or new causes; and so on, descending until we arrive at the ultimate effects, the symptoms in question: or, that we may inquire into the causes of the symptoms, and into the causes of those causes, and so on, ascending until we arrive at the remote causes; or, that these two modes may be combined, and that the agreement of the two in the same result is a strong confirmation of its truth.

Instead however of following this simple and natural course, and bending their whole attention to the inquiry, in the descending line into the effect, or in the ascending line into the cause, of the successively ascertained points of the series of causes, and thus step by step dispelling the gloom in which the subject is involved, physicians have, as was before observed, resorted to hypothesis for aid to enable them to explain the phenomena of disease.

The most ancient hypothesis we are acquainted with is that contained in the writings attributed to Hippocrates; according to which health consists in the due proportion of the four humours of which the body was supposed to be formed; viz. phlegm, blood, bile, and black bile; and disease, in an undue proportion of the same; the evil consequences of which were guarded against by the care of a superintending principle.

When an undue proportion of the humours exists, or when one is in excess, the superintending principle, according to this doctrine, excites a commotion, during which the blood is purifi-

ed, the morbid humours discharged by the bowels, the bladder, or the skin, and, the purpose of the febrile commotion having been effected, the inordinate action ceases, and health is restored.

This doctrine continued in high esteem in Europe until late in the eighteenth century; and was without a rival until the sixteenth, when the chemical sect of physicians arose. According to their theory, diseases are produced by the prevalence of an acid or an alkaline state of the fluids, and are to be cured by the administration of medicines of a character opposite to that of the cause of the disease.

In the seventeenth century an attempt was made to apply mathematical and mechanical principles to the explanation of the phenomena of disease, and for a time attracted the attention of physicians. It was however soon discovered, that neither the science which relates to the properties and dimensions of inert matter, nor that which treats of the mutual attractions of the elements of matter, is applicable to the explanation of the operations of the living body. These hypotheses were accordingly soon laid aside.

In the end of the seventeenth century the celebrated Stahl made an addition to the ancient doctrine. He believed that there is in the system a constant tendency to plethora; that this state and a bad state of the humours are the causes of disease; and that the office of the presiding power, to which he like his predecessors attributed intelligence, is to produce the necessary evacuations to keep down the plethora, as well as to correct the bad state of the fluids.

The leading points of this ancient doctrine, the Humoral Pathology, are a bad state of the fluids, to which Stahl added a constant tendency to plethora; and a superintending intelligent principle, whose office is to correct the disordered state, by exciting commotion, depuration, and evacuation.

It is defective in assuming without proof, that the internal derangement consists in a disordered state of the fluids; in not showing how the disordered state or internal derangement is produced by the remote causes; in not showing how this state produces the symptoms of disease, particularly the increased ac-

tion in fever; and in referring them to a presiding power which is not shown to exist. In other words, it does not trace the connexion between the remote causes and the symptoms of disease.

Some few years after Stahl's addition to the ancient doctrine of Hippocrates, Hoffman proposed a theory, containing a number of the doctrines of the day; but in addition to them, he taught that health consists in a certain tone of the moving fibre, and that disease is produced by too great or too little tone, by spasm or atony.

It may be sufficient to object to this doctrine, that spasm and atony are symptoms of disease, effects of the remote causes, and not themselves remote causes.

In the beginning of the eighteenth century, Boerhaave, a man of great genius, industry, and learning, formed a theory of materials selected from every side, which was so well received, that his praises rung throughout Europe.

He attributed diseases to various states of the solids and the fluids; to a weak and lax, and to a stiff and elastic fibre; to an acid acrimony, a spontaneous glue, and a spontaneous alkali in the fluids; to excessive and to defective circulatory motion; and to plethora. The diseases arising from each of these different states were to be cured by remedies tending to produce an opposite state of the system. It is needless to say more of these states than what has been said of Hoffman's doctrine of spasm and atony. Those of them that ever exist, are themselves disease, the effects of the remote causes, not themselves remote causes.

His theory of fever is that some of the above, and other remote causes produce the proximate cause.[1] He is not however precise in stating the proximate cause. He says, "whence it appears, that then (in the cold fit) the bloody humours do stagnate at the ends of the capillary vessels, and that there is notwithstanding at the same time *some cause* that irritates the heart.[2] "So that after a due examen of the whole history of intermitting fevers it must be concluded, that their proximate

1 Boerhaave's Aphorisms, 583. 586. 2 Ibid. 577.

cause is a viscosity of the arterial fluid, upon which succeeds any one of the causes of the too strong and quick contraction of the heart, and a resolution of what had been stagnated."[1]

He does not say whether the obstruction in the capillary vessels, the existence of which is assumed, produces directly or indirectly the increased action, and he does not show that it does it in either way.

To these visionary doctrines, and to the monstrous absurdities connected with them, of which a specimen may be seen in the works of Sydenham,[2] and in the Aphorisms of Boerhaave,[3] the language of Dr. Gregory is strikingly applicable: "Non est dissimulandum, theoriæ medicæ scriptores hominum patientia multum abusos esse, et sibi aliisque, nuper et olim, miris ineptiis impossuisse."*

These theories have however been abandoned; and in their stead have been advanced several others, which have in turn attracted the attention, and divided the opinions of medical men. Hitherto little notice had been taken of the remote causes of fever: Boerhaave mentions them, but does not show their operation on the system. Cullen, whose theory followed next, seems to have taken a more enlarged and comprehensive view of the subject than any of his predecessors.

He pointed out the effect of the remote causes, viz. debility; and after showing, from the symptoms preceding a febrile paroxysm,[4] and also from the consideration that the remote causes are of a debilitating nature,[5] that a state of debility exists in the commencement of fever, he says,[6] "It is therefore evident that there are three states which always take place in fever; a state of debility, a state of cold, and a state of heat; and as these three states regularly and constantly succeed each other in the order we have mentioned them, it is presumed that

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* It is not to be concealed that the writers of the theory of medicine have greatly abused the patience of mankind, and have imposed on themselves and others, lately and formerly by wonderful absurdities.

1 Boerhaave's Aphorisms, 755. 2 Sect. i, ch. i, art. i. ch. iv, art i. ch. v, art. 2. 3. 4. 10. sect. 2, ch. ii, art. 11. sect. 6, ch. iii, art. 5. 3 Boerhaave's Aphorisms, 63. 64. 70 to 73. 85. 86. 4 Cullen's First Lines, &c. xxxv. 5 Ibid. xxxvi. 6 Ibid. xxxvii.

they are in the series of cause and effect with respect to one another. This we hold a matter of fact, even although we should not be able to explain in what manner, or by what mechanical means these states severally produce each other." Instead however of patiently investigating the connexion he had observed between the different stages, whereby he might have discovered the manner in which the one produces the other, he contented himself with referring the matter to the old doctrine of a superintending power in the system, which ever since the days of Hippocrates had been the resource of physicians in their attempts to explain the phenomena of fever. Apparently desirous however of avoiding the absurdity of the doctrine of a superintending *intelligent* principle, he calls it a general law of the animal œconomy; but in the same paragraph,[1] speaks of it as *a power* producing effects, viz. "many of the motions excited in fever."

Considered as a power, there is no evidence of its existence—Considered in either light, as a power or a law of the system, referring to it those phenomena of fever, *which the author admits he cannot explain*, affords no information.

Referring certain morbid symptoms to a general law of the system, of the nature of which no account is given, nor any account of the manner of its operation in producing the effects, *is no explanation.*[1] It is perfectly obvious, a mere truism, that they happen by a law of the animal œconomy. The question is, *what is that law? In what manner are these phenomena produced?*

This system is defective therefore in not explaining the manner in which each of the series of causes produces that which follows it.[2]

The inability to explain being admitted,[2] it is wrong in attributing the phenomena to a power,[2] *the vis medicatrix naturæ*, of the existence of which (as a power) there is no evidence.

It is wrong in attributing to that power, an effect, of the existence of which there is no evidence, viz. spasm of the extreme vessels.[3] The evidence which Cullen offers, "the sup-

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1 Cullen's First Lines, &c. xxxviii. 2 Ibid, xxxviii. 3 Ibid, xlix.

pression of all excretions, and the shrinking of the external parts"[1] may be imputed not only "in part," but wholly "to the weaker action of the heart in propelling the blood into the extreme vessels."[1] There is at any rate no certainty, and Cullen's own language, "there seems to be a spasm,"[1] shows a consciousness of the uncertainty of its existence.

It is wrong in attributing the increased action to that effect of the supposed power, viz. to spasm of the extreme vessels, [2] as to an intermediate cause; without producing any evidence that such spasm, supposing it to exist, is capable of exciting increased action; the doctrine being left to rest on the common opinion of physicians.[3]

This theory is moreover defective in excluding stimulants from the list of remote causes. They are, undoubtedly, often remote causes of fever: by exciting the action of the heart too high to last, they indirectly produce the debility which precedes fever.[4]

It is wrong in stating that the causes act on the nervous system primarily, and thus diminishing the energy of the brain produce debility. The remote cause, miasmata, produces effects on the system, viz. darkness of the complexion and blackness of the blood, long before there is any diminution of the energy of the brain. On the contrary, it is often observed that persons just before an attack of fever are extraordinarily brilliant in their thoughts and language.

The remote cause, cold, produces a manifest weakness of the action of the heart and arteries, long before the energy of the brain is lessened.

The theory of Cullen is superior to the ancient theory of Hippocrates, in attributing the phenomena observed to a law of the animal œconomy, instead of an intelligent superintending principle. But what the law is, or how it operates in producing the effects observed, he does not explain. Spasm of the extreme vessels is the only specified intermediate cause of the increased action. That this state of these vessels exists, he does not show; how it is produced, he admits he cannot ex-

1 Cullen's First Lines, &c. xl. 2 Ibid. xli. 3. Ibid. xxxix.
4 Ibid. xxxvii. and Rush's Works, vol. 3, p. 3.

plain;[1] how it produces the effect attributed to it, he does not attempt to say. In short, he does not trace the connexion between the remote causes and the symptoms of fever.

Brown taught that the life of man and other animals consists "in this property alone; that they can be affected by external agents, as well as by certain functions peculiar to themselves, in such a manner that the phenomena peculiar to their living state, that is, their own functions, can be produced."[2] This property is called excitability; and the external agents, exciting powers.[3] The effect of the exciting powers acting upon the excitability, is denominated excitement.[4]

"Excitement, the effect of the exciting powers, the true cause of life, is, within certain boundaries, produced in a degree proportioned to the degree of stimulus. The degree of stimulus, when moderate produces health; in a higher degree it gives occasion to diseases of excessive stimulus; in a lower degree, or ultimately low, it induces those which depend upon a deficiency of stimulus, or debility."[5]

"A is affected with a disease of debility, where the excitement has gone down to 10 degrees, the excitability mounted up to 70 degrees in the scale. What is to be done? By a proper use of high stimulants, the 30 degrees of lost excitement may be restored, and as many of superfluous excitability discharged, and the excitement and excitability made to meet again at the middle point of 40. If the remedies are carried up to any degree betwixt 40 and 55, they have gone too far, and produced predisposition to sthenic diseases; if still farther, but not exceeding 70, they will have produced one or other of these diseases; but carried beyond 70, the diseases which their operation produces, are those of indirect debility."[6]

It follows from this doctrine that there is no other difference between sickness and health, than different degrees of excitement; consequently, that a man drinking wine so as to produce the highest degree of excitement, must have passed through one or other of the sthenic diseases; that a man, in passing from a high state of excitement, in synocha for instance,

1 Cullen's First Lines &c. xxxviii. 2 Brown's Elements, x. 3 Ibid. xiv. 4 Ibid. xvi. 5 Ibid. xxiii. 6 Ibid. lxxi, note d.

to a low one, by letting blood, must pass through the state of health; and, as excitement is easily reduced by the loss of blood, that a man should be cured of a sthenic disease in a few minutes.

This doctrine also makes predisposition to sthenic diseases consist in increased excitement; whereas diminished excitement, sometimes in a remarkable degree, precedes even those diseases admitted by the author to be sthenic; viz. synocha, catarrh, &c.

It also considers disease as the direct effect of increasing or diminishing the exciting powers; diseases of excessive excitement proceeding from the former, and those of reduced excitement from the latter. In opposition to this however, diseases of the highest excitement often follow the abstraction of exciting power; as in peripneumony, and dysentery from cold.

In short, this doctrine overlooks the whole train of causes between the remote causes and the symptoms of disease.

Rush's theory of fever is, that the effect of the remote causes of fever is to produce debility; either by excess of stimulus, first elevating the excitement of the system above its healthy grade, and afterwards reducing it down to that state which he calls debility of action; or, by abstraction of natural stimuli, reducing the system below its healthy grade of excitement.[1]

Debility being thus formed in the system, a sudden accumulation of excitability takes place, whereby a predisposition is created to fever.[2]

Additional stimuli, or the common impressions which support life, sometimes become irritants, and readily add another link to the chain of causes which induce fever; and that is, depression of the whole system, or what Dr. Brown calls indirect debility.[2]

By the continued action of stimuli, reaction is induced, and in this reaction, according to its greater or less force and extent, consist the different degrees of fever.[3]

According to this theory, in those cases in which stimulants are the remote causes,

Stimulants produce debility, which is followed by accumulation of excitability;

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1 Rush's Works, vol. 3, p. 3, 4. 2 Ibid. p. 5. 3 Ibid. p. 6.

Stimulants, additional or common, produce depression;

Stimulants, morbid or natural, continuing to act, produce reaction.

Moreover "the same remote cause is often debilitating, stimulating, and depressing;"

And further, "in certain fevers the remote cause sometimes excites convulsions in the blood-vessels, (that is fever,) without being preceded by preternatural debility and excitability; and with but little or no depression of the system."[1]

If this were the case, the increased action would be the direct effect of the remote cause, and the same as the excitement of Brown. But there are no such short cuts as this in natural operations. The succession of cause and effect is uniform. It is only because of the rapidity of the operation, that, in some cases, we do not perceive the different steps; which nevertheless occur in order. All that are inconsistent with that rapidity, and occur not then, are not necessary, and therefore never do; as nature does nothing in vain.[2]

It is evident therefore that having proposed as links of the chain of causes, states of the system which he himself admits are not essential to the production of fever, he has overlooked the true series of causes, extending from the remote causes to increased action of the heart and arteries.

Moreover there is no real difference between the effect of stimulant remote causes, *debility of action*, and the effect of stimuli additional or common, *depression* or *the indirect debility of Dr. Brown;* because both states are the effect of stimuli; and even of the very same stimuli, as is fully admitted by Rush; and because the marks of the second debility, or depression, "weakness of the limbs, inability to stand or walk without pain, or a sense of fatigue, a dry, cool, or cold skin, chilliness, a shrinking of the hands and face, and a weak or quick pulse," are the well known effects of the remote causes, often produced in a few minutes; and even of the abstraction of stimulus, as on the application of cold. Therefore these states are the same, and depression, as a separate step in the process, does not exist.

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1 Rush's works, vol. 3, p. 14. 2 Newton's first rule of Philosophizing.

It is objected also that stimulants, additional or common, having produced depression, continuing to act should continue to produce greater and greater depression, and never produce reaction.

This inconsistency is the more striking when it is stated that the same remote cause sometimes acts as a debilitating, depressing, and stimulating agent; in other words, continuing to act on the same system, it first debilitates, next depresses, and lastly stimulates. It is manifest that a cause which debilitates will continue to debilitate, and that increased action will never take place without the intervention of some other cause. [1] This cause, connecting debility with increased action, produced by the former and producing the latter, is the desideratum of all the systems that have been offered to the world; and Rush, like his predecessors, has resorted to hypothesis as a substitute for it.

His hypothesis, that debility, the effect of the remote causes, is followed by sudden accumulation of excitability, so great that the common stimuli which support life are enabled to produce all that follows, is unsupported by evidence, is destroyed by his own admission that it does not always occur, and therefore is not essential, and appears to have been invented to account for the occurrence of fever or increased action, when there are present no other than the common stimuli which support life. For, rightly believing stimulus necessary to produce action, and resorting to the common stimuli which support life when he perceived no other present, (particularly when a chill and fever is produced by going into cold water,) he found it necessary to resort to hypothesis to account for common stimuli producing increased action.

Darwin's theory rests on the same principle with that of Rush, that accumulation of excitability follows reduced action, and upon a sympathetic influence supposed to be exerted by one part over another; on the latter theory so much, that the author denominated it the Sympathetic Theory of Fever.

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1 See Boerhaave's theory of fever a few pages back, "there is *some* cause that irritates the heart."

These theories are defective in attempting too exclusively to account for the single symptom, increased action of the heart; and in resorting, in order even to do this, to the hypothesis of a vis medicatrix naturæ, of a sympathetic influence of one part over another, and of a sudden increase of excitability following the debility produced by the remote causes.

With respect to the latter hypothesis, (not to repeat that Rush himself admits that it does not always occur, and therefore is not essential, and consequently not one of the links of the chain of causes producing the effect in question,) it is to be observed that debility proceeding from excess of stimulus is a state of exhaustion; the patient has been excited to action until he can be excited no longer, and it is some time before common stimuli can produce the usual excitement, and extraordinary stimuli are often resorted to in order to effect it. Of course sudden increase of excitability does not follow debility thus produced.

Moreover when debility proceeds from abstraction of stimulus, although the patient in some cases appears to become more excitable, it is not always so. Thus when Dr. Currie immersed a man in very cold water for some time, and he was very much debilitated, his pulse and temperature being very much reduced, he found that immersing him afterwards in hot water did not for several hours produce the natural state of excitement.[1]

Inasmuch therefore as the intermediate cause between debility and increased action is the effect of the former however produced, sudden increase of excitability, which does not follow that debility which proceeds from stimuli, cannot be the intermediate cause.

With regard to the vis medicatrix naturæ, it is unquestionable that the body is so constituted, that an injurious impression often gives rise to an action, or to a series of actions, the tendency of which is to remedy the evil. But to represent this law of the system as a power, and to attribute to it important

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1 Currie's Med. Reports, exp. 1. 4. 10 on the effects of immersion in cold water.

operations, without showing how they are affected by it, is not a very satisfactory mode of explaining difficult things.

The truth is, in this as well as in every other case of the application of agents to the body, those agents themselves, the phenomena observed on their application, and the intermediate links, effects of the former and causes of the latter, constitute a chain of causes and effects; and the interposition of any power is unnecessary. The intelligence displayed in the organization of the human system, does not consist in occasional efforts to remove evils as they occur, but in so constituting the body *originally*, that an evil impression made on it is the first link of a chain of causes, of which the last alleviates or removes the evil: and the true theory of a disease consists in explaining the manner in which each link of a series of causes produces that which immediately succeeds; not in referring the whole *to a law whereby it happens.*

To the use of the term sympathy, objections equally strong may be made. Certain parts of the body, as the head, the liver, the stomach, are observed, in common, to be disordered together; so that when one is affected, the others seldom escape. To account for the simultaneous appearance of these affections, it is said that they are produced by sympathy between the parts in question. In order to understand the answer, and to judge of its correctness, it is necessary to ascertain the precise idea intended to be conveyed by this term.

In common acceptation, sympathy signifies fellow feeling, or an affection felt by one person in consequence of the affection of another. When one is in distress, and we feel for him, we are said to sympathize with him; but actual suffering of the person sympathizing is not included in the idea. If both are suffering, they are fellow-sufferers. Each suffers, but his suffering is his own.

Now, in the case of different parts of the body suffering at the same time, it is obvious that their suffering is actual. Therefore they do not sympathize in the common acceptation of the word.

If the term be used in a sense different from that in which it is commonly received, it becomes necessary to define the

sense in which it is used. The advocates of this doctrine have defined sympathy to be such a connexion between different parts. that "a certain condition prevailing in the one part occasions a similar condition in the other."[1] As however the affections of the parts sympathizing are often dissimilar, others have given the name of sympathy to such a connexion between distant parts, that when one is affected the other is likewise. A late writer has called it "the mutual influence of distant parts."[2]

Before we are at liberty however to attribute important operations to such influence of one part over another, it is absolutely necessary to show that it exists. What evidence of its existence is offered?

Whytt says, "there is a particular and very remarkable sympathy between several of its organs (the organs of the body) by means of which many operations are carried on in a sound state; and pain, convulsive motion, and other morbid symptoms, are often produced in such parts as have no near connexion with those that are immediately affected. To illustrate this I shall give several instances."[3] The following are a few of them.

Violent pains in the head are frequently attended with a sickness at the stomach and vomiting.

A pain in the teeth often affects the cheek-bone, one side of the head, the throat, and the corresponding ear.

A disordered state of the stomach and intestines, with wind or noxious humours lodging in them, will sometimes so affect the brain, as to deprive people of their reason. At other times the same causes will produce a vertigo, cephalæa, hemicrania, clavus hystericus, head-ach, palpitations, intermission of the pulse, difficulty of breathing, sudden flushings of heat, sweating, &c.

After giving many other instances in which he shows, as in those above-mentioned, that certain parts of the body being morbidly affected, certain other parts are also frequently affected at the same time, he says, "Many other examples of sympathy, both in a sound and morbid state of the body, might be mentioned;" &c.[4]

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1 Cullen's First Lines &c. xliv. 2 Blane's Medical Logic, p. 143.
3 Whytt on the Nerves, p. 14. 4 Ibid. p. 29.

Other writers treat the subject in the same way, and seem to think, when they produce cases of simultaneous affection of different parts, that they produce instances of the influence of one part over another. It is however very evident that they are no more than cases of the former, which the latter is introduced to explain: and it does not by any means follow necessarily that this simultaneous affection is produced by a sympathetic influence of one part over another: for it may be that these affections are the common effects of some cause operating simultaneously on the different parts affected. The question is, in which of these two ways do the affections occur together?

The doctrine of a sympathetic influence of one part over another is beset with difficulties and leads to absurd conclusions.

The introduction of this doctrine to explain the phenomena of fever, has led its advocates to fix upon the stomach as the seat of the primary action of the remote cause of fever, the most extensive in its operation. It has been asserted, that intermitting fever arises from a morbid impression made on the stomach, by the direct action of miasmata which enter by the mouth, the head and the liver being affected in consequence of the influence the stomach exerts over them. But to this doctrine there are insuperable objections.

The remote cause, miasmata, does not produce its first effects on the stomach. It affects the colour of the blood of every person exposed to its operation; and with this, the colour of the skin, and of the passages when under the operation of a cathartic, and often without. The blood, the skin, and the passages, all become darker; the former and the latter often black. This is the case with those who are apparently not at all affected, who are about their daily business and eating heartily.

Any body, during the prevalence of an autumnal epidemic of any severity, on taking a mercurial cathartic, and many without, will have black or green passages: or, if blood be drawn, it will be found black.

The same remote cause often produces, before any disorder of the stomach is observed, other symptoms which precede fever and have therefore been called premonitory symptoms; as listlessness, weakness, sleepiness, slight pain in the head, verti-

ginous affections, &c. and all these in many cases in which the appetite continues good to the time of the attack. These symptoms preceding the affection of the stomach, it is very evident that the stomach is not the part first affected, and that they are not produced in consequence of an affection of that part, by means of its influence over other parts.

Moreover, many of the remote causes are of such a nature that the idea of their being taken into the stomach is absurd. A man exposed to a cold rain becomes chilly and a fever often follows: fear is another remote cause of fever; also loss of blood, a fall or a blow. None of these however act directly on the stomach. They nevertheless produce nausea, and some of them with more certainty than miasmata. Thus, bleeding largely will certainly produce nausea and often vomiting: a fall or a blow often produces the same. The disorder of the stomach in fever therefore, is not the direct effect of the remote causes acting on the stomach.

Inasmuch as the stomach is very often not the part first disordered, and as this disorder when produced is not the effect of the direct action of the remote causes, it follows that the disorder of the head, liver, &c. is not the effect of a morbid impression on the stomach, by means of the sympathetic influence of the latter over the former.

A sympathetic influence of one part over another, implies a medium or channel of communication between those parts. There is no part known to have influence over another without a channel to convey that influence. The influence of the brain is conveyed to the different parts of the body through the channel of the nerves; and if the free passage of that influence through one of them be interrupted by ligature, vain is every effort to move the part supplied through that nerve. If this influence, so essential to the slightest motion of every part, to the well-being of the body, and to life itself, be not able to pass without a channel of communication, the strongest presumption arises of the necessity of such a channel in every case of influence of one part over another.

The advocates of the doctrine of sympathy fully aware of

this, have endeavoured to show that the nervous system is the medium of conveying sympathetic influence.[1]

If this were so, when the brain is affected, all the other parts ought to be affected,[2] and the affection ought to be in proportion to that of the brain; those parts which are intimately connected, ought always to suffer together; and they ought to suffer in proportion to the closeness of the connexion.

But none of these inferences hold good. The nervous system cannot therefore be the medium. This is admitted by Dr. Blane who strenuously advocates the doctrine of sympathy. He says, "We find in some old anatomical books, an attempt to trace sympathies to the ramifications proceeding from the common trunk of a nerve; but better observation has proved that sympathies have little or no dependance on the connexion and distribution of nerves."[3]

Convinced however of the absolute necessity of a medium he says, "the medium of this communication is probably some imponderable fluid;"[4] a full admission that there is no known medium.

A medium therefore being necessary, and none provided for the passage of sympathetic influence from one part to another, none such passes, and therefore none exists; the only purpose for which it is supposed to exist, not being effected.

There is therefore nothing more than a simultaneous appearance of the affections in question. Every thing more than this is assumed. Whytt's instances show no more. Cullen only presumes the existence of the consent.[5] Richerand asserts a relation between certain parts, but acknowledges we know nothing of its nature.

Some have taken a more philosophical view of this subject, and have admitted that the term, sympathy, merely expresses the fact that there is a certain connexion between different parts, whereby when one is affected the other is likewise. According to this view, sympathy is the mere name of the connexion, and its nature is still a subject of investigation. Such how-

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1 Cullen's First Lines &c. xliv. Whytt on the Nerves, p. 10.
2 Whytt on the Nerves, p. 11. 3 Blane's Medical Logic, p. 145.
4 Ibid. p. 143. 5 Cullen's First Lines, xliv.

ever is the influence of names over the human mind, that we insensibly glide into the belief that we understand an operation when we have only given it a name. "Antiquum enim et usitatissimum apud medicos est, sibi aliisque persuadere se rem intelligere, cum nomen tantum didicerint," &c. Thus, if we ask why is the head affected when the stomach is disordered, and are told it is by sympathy, there is an appearance of an answer; but it is evident we have learnt nothing if we put the definition in place of the term. If we should answer the question by saying the head is affected by the connexion that exists between it and the stomach, no one would consider it a satisfactory solution.

There is a striking instance of this delusion in a work published by an eminent physician.[1] After insisting on the retention of the term sympathy, on the ground that we must have some word to express what actually takes place in certain operations of the system, and if we reject this we must invent another, he says, "Some of the most striking phenomena, such as the translation and conversion of diseases, can in no other way be explained:" Whence it is fair to infer that he thinks this word expressing only what actually takes place in certain operations, *explains the nature* of those operations.

The doctrine of a sympathetic influence of one part over another is in fact surrendered by this limitation of the term sympathy to express the fact only of the connexion, while the nature of the connexion is still a subject of investigation.

With regard to the question, are these affections produced by some cause acting simultaneously on the different parts? it is certain that the affections of the head, stomach, and liver occur in consequence of exposure to the action of certain remote causes of disease, and therefore each of them is an effect of the operation of those remote causes, or of some intermediate cause, on that particular part.

The relation between the affections of the different parts must therefore be that of cause and effect, or that of effects of a common cause. If one be the cause of the other, it must al-

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1 Blane's Medical Logic.

ways precede; if it sometimes succeed the other, it cannot be the cause. If therefore in consequence of the action of certain causes, two affections ordinarily appear together, the one or the other, indifferently, preceding, they are effects of a common cause. In order to ascertain how and why these affections occur together, the proper course is to inquire the cause of each, and to trace up the chain of causes from each to the remote causes. Thus shall we discover the relation they bear to one another, or the nature of their connexion, and the reason of their occurring together.

We have thus endeavoured to show that the remote causes and the symptoms of disease are the extremes of a series of causes and effects; to point out the proper course of inquiry in attempting to investigate the connexion between them; to show that instead of prosecuting the inquiry in this way, physicians have had recourse to various hypotheses to enable them to explain the morbid phenomena; that these hypotheses are unfounded, at least to the extent assigned them, and insufficient to explain the phenomena observed; and therefore that the great problem, what are the connecting links between the remote causes and the symptoms of fever, is not yet solved.

The solution of this problem is so important, that an attempt to effect it on the principles proposed should secure the favourable attention of medical men. It is proposed to give in this paper, necessarily limited, the outline of such an attempt, in which the connexion between the remote causes and the symptoms is investigated by inquiring into the effects of those causes; next into the effects of those effects, or new causes; and so on descending to the ultimate effects, the symptoms in question.

The first proposition I would lay down is, that the remote causes of fever weaken the action of the heart. The principal of these are cold and miasmata.

The experiments of Dr. Currie of Liverpool on the effect of immersing a hearty young man in very cold water, show in the plainest manner that cold applications to the body reduce the pulse and the temperature, and consequently weaken the action of the heart: in one of the experiments when the man had

been immersed an unusually long time, Dr. Currie examined the motion of the heart and found it feeble and languid, and with considerable difficulty restored it to its usual state.

Cold has indeed been called a stimulant. It is alleged that a glow of heat is produced by dashing cold water on the body. This glow is not however the effect of cold. If a cold application be made for a few moments and then be withdrawn, the glow will appear; but never if the application be continued. The glow of heat therefore, is the consequence of withdrawing the depressing power cold; during the continuance of which, according to the uniform experience of Currie, the temperature never rises as high as before immersion; but on the contrary is, if continued too long, nearly extinguished.

The contraction of the scrotum on the application of cold has also been regarded as evidence that the latter is a stimulant. The conclusion rests on the assumption that this contraction is a state of excitement. This however will appear to be unfounded when we consider that the contraction of the scrotum is of the same nature with that of the whole skin, which is gradually produced by the continuance of the cold application; and that when the skin of every part is shrivelled to the utmost, and the patient's lips, nails, and other external parts are shrunk and livid, the scrotum and every thing connected with it, are contracted into the smallest space they can occupy. It is evident then that the contraction of the scrotum is no more a state of excitement than that of the skin, and other shrunk and livid external parts; and consequently does not afford any ground for believing cold to be a stimulant.

Cold therefore weakens the action of the heart.

Miasmata do the same. It is a matter of common observation that the blood drawn from persons who have been exposed to the influence of this remote cause of fever, is darker than usual. It is often nearly black, even in those who are not ill. Black blood does not stimulate the left ventricle of the heart as the scarlet blood does. Goodwin, in his experiments on the respiration of different animals, says "he attended carefully to the changes in the colour of the blood, and in the corresponding contractions in the left auricle and ventricle of the heart: and

in all the examples observed that when the blood which passed into the left auricle was florid, the auricle and ventricle contracted strongly, and the circulation went on as in health; but when the blood began to put on a shade of brown, the contractions were diminished, and when it was black the contractions ceased, although the auricle was distended with blood," [1] &c.

Thus blackness of the blood, and consequent weakness of the action of the heart, is the effect of miasmata.

All the other remote causes of fever likewise, either directly or indirectly, weaken the action of the heart. This effect of the remote causes is therefore a link of the chain of causes connecting them with the symptoms; and this conclusion is confirmed by the uniform experience, that weakened action of the heart precedes every fever. Our next inquiry then is into the effects of this new cause, weakened action of the heart.

One consequence immediately flowing from weakened action of the heart, is the diminution of the quantity of blood sent into the arteries; whence follows weakness of the pulse, a very obvious consequence of the diminution of the quantity of the fluid which distends the arteries; 2d, paleness and coldness of the surface, consequences as certain of the failure of the usual supply of blood to the surface; 3d, diminished bulk of the external parts, shrinking of the features, and shrivelling of the skin, all necessarily following deficient fulness of the cutaneous and subcutaneous vessels.

Weakness of the pulse, paleness and coldness of the surface, and diminished bulk of the external parts, shrinking of the features, and shrivelling of the skin, are therefore immediate consequences of diminished action of the heart.

There is another consequence of weakened action of the heart, very extensive in its operations on the system, and that is accumulation of blood in the vena cava and its great branches.

The arteries have the power of expelling the blood thrown into them by the heart, so perfectly when the heart ceases to act, that after death they are found empty. The veins are

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1 Goodwin on the connexion of life with respiration, p. 72 to 81.

flaccid vessels, exerting little force on their contents, and readily yielding to a distending force. There is therefore a constant tendency to accumulation of blood in the veins.

While the heart acts vigorously, the vital fluid is passed on to the arteries as fast as it presents itself; but as soon as the action of that organ is diminished, less is received from the cava, and the great veins are distended. If the diminution of the action of the heart be sudden, in a little time the accumulating blood presses on the heart, and stimulates it to increased action, whereby the evil is sometimes remedied. But the continued operation of the causes, in force sufficient to produce continued weakness of the action of the heart, produces continued accumulation in the great veins.

It follows therefore from the structure of the heart, the arteries and the veins, that accumulation of blood in the latter is the inevitable and immediate effect of weakened action of the heart.

This conclusion is confirmed by what is observed after death: the cava and its branches are found distended with blood, the arteries empty. This is not the effect of disease: in all the vigour of life, if the action of the heart be stopped, the immediate consequence is the same. "When the breast of a living dog is opened by taking away the sternum with the cartilaginous appendices of the ribs, the lungs are observed suddenly to sink, and afterwards the circulation of the blood, and the motion of the heart to cease. In a little time after that, the right ventricle of the heart and the vena cava are swelled as if they were ready to burst."[1]

As accumulation of blood in the cava, necessarily extends into its great branches, let us inquire how far it extends, and what branches are readily filled.

The veins of the fleshy parts having the benefit of almost perpetual action of the muscles, and of the aid of valves to prevent regurgitation and to give the more complete effect to the muscular pressure, the blood has but little opportunity to accumulate in them, but is instantly driven to the interior of the body.

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1 Bell's Anat. vol. 1, p. 350.

The vena cava and its branches between the last valves and the heart, being destitute of those aids which in other parts help the blood along, must be the chief seat of venous plethora. This great cavity therefore, which for convenience we shall call the venous cavity, consists of the vena cava, the external and internal jugular veins, the subclavian veins, the hepatic veins and their branches in the liver, the vena portæ and its branches in the liver, the spleen, the stomach, and intestines, the veins of the kidneys, the external iliac and crural veins, and the internal iliac, or hypogastric veins. The cavity is limited by strong valves at the mouth of the azygos, the coronary veins of the heart, and where the veins pass out from the limbs into the trunk of the body.

Accumulation of blood in the cava and its branches being the effect of weakened action of the heart, is another link of the chain of causes extending from the remote causes to the symptoms. The next question is, what are the effects of this new cause?

Accumulation of blood in the cava and its branches, produces different effects when gradually produced, from what it does when it suddenly takes place.

When the action of the heart is suddenly diminished, the accumulation of blood produced by suddenly checking a current so large and strong, distends the cava, so that it appears as if ready to burst. By the continued arrival of blood, the accumulation distends successive portions of the cava, and of those of its branches which are unprotected by valves; and the distension of successive portions, rapidly made, has the effect of a current running back from the heart. As soon as the distending fluid reaches the valves which limit the venous cavity, they are raised; and this backward wave is instantly arrested, rebounds, and the impulse is directed towards the heart. If this organ have not lost its excitability, the sudden entry of the blood excites it to action, the circulation is restored, and the accumulation of blood in the venous cavity lessened.

Two or three years ago, I bled a boy with a remarkably strong pulse, until he fainted. The pulse ceased, he became

very pale, and the flow of blood stopped. In a moment afterwards, the finger being over the radial artery, at the same instant the pulse was full, the blood sprung from the orifice in the vein, and the countenance was flushed.

When by the continued operation of the causes of weakened action of the heart, gradual accumulation of blood in the venous cavity is produced, it gradually distends every part of the cavity, and necessarily produces the effects of distension on all the parts concerned.

In order to have a distinct idea of the parts affected by this accumulation of blood, let us suppose the action of the heart suddenly to cease. The check given to the current through the heart, would instantly produce distension of the cava; which would, in every successive moment, dilate successive portions of that vessel and its branches until the valves should be raised. It is evident that at that moment, the blood would distend the cava, the internal and external jugular veins, the subclavian, the hepatic, the renal, the hypogastric, and the external iliac and crural veins; and consequently produce simultaneous effects on the head, liver, stomach, and kidneys.

We are therefore to inquire into the effects of accumulation of blood in the veins of these several parts.

The effects of accumulation of blood in the veins of the head are vertigo, pain, stupor, and convulsions. We know from the dissection of the bodies of those who have died of these affections, that the vessels of the head are excessively distended with blood; and we know, from the effect of a ligature round the neck, preventing the return of the blood from the head, that accumulation of that fluid in the vessels of this part, will produce the symptoms above mentioned. It is obvious that in those cases of pain, stupor, and convulsions, in which the pulse is so weak as to deter the physician from bleeding, many instances of which I have seen, and of which Morgagni mentions some, the veins, not the arteries, are the distended vessels.

Accumulation of blood in the vessels of a gland interrupts the regular and healthy performance of its functions. When the mamma after parturition is distended to a certain degree,

milk is secreted; in a greater degree it is suppressed, and in order to enable that gland to perform its natural function, it is necessary to lessen the distension. A certain degree of distension of the vessels of a gland therefore, is necessary to secretion, and too great distension of its vessels puts an end to it.

Accumulation of blood in the veins of the liver therefore, in a certain degree increases secretion; in a higher suppresses it.

In the same way the functions of the glands which secrete the gastric juice, are interrupted by accumulation of blood in the veins of the stomach.

The functions of the kidneys are also affected by the same cause, but as the varying state of the secretion of those glands is less important in its consequences, it is less attended to.

Accumulation of blood in the cava, and in its branches in the head, stomach, liver, and kidneys, produces therefore a disordered state of the functions of those parts at the same time; and the effects or symptoms thus produced, variously combined, sometimes one and sometimes another being most prominent, constitute most of the chronic diseases.

These are the effects of gradual and habitual accumulation of blood in the cava, &c.; but in this state a sudden increase of the quantity of blood in the vena cava, &c. produced by the sudden diminution of the action of the heart by the operation of any remote cause, as by riding in the rain, will, as soon as the depressing power is removed, and the heart is left free to act, force the latter into increased action; or if the accumulation amount to that degree which gives rise to convulsive agitation of the body, as in an ague, whereby all the veins are compressed, and the blood is urged vehemently on to the heart, that organ, excited by an increased quantity of its natural stimulus to increased action, fills the arteries, distends their most remote branches, expands the features, and communicates to the external parts increased heat and colour.

The increased action of the heart continues until that muscle, like all others, after long and violent action, is less disposed to it, and gradually relaxes its efforts. The venous cavity likewise, being by this process emptied of its excess of blood, pours less and less into the heart. The heart being less exci-

table, and the stimulus failing, its action becomes more and more feeble, which leads directly to renewed accumulation of blood in the venous cavity, and to all its consequences.

This accumulation continually increasing, and the heart during its feeble action acquiring from rest, like every other muscle renewed power to act, both at length arrive at that point in which renewed vigour and abundant stimulus meet, and produce a repetition of the increased action of the heart; which continues until relaxation again comes on, and gives rise to renewed accumulation of blood in the venous cavity, and renewed action.

Thus it appears that the train of symptoms, weakness of the pulse, diminution of the bulk of the external parts of the body, shrinking of the features and of the skin, paleness and coldness of the surface, arise from the heart's failing to send blood to the surface; and from its consequent accumulation in the venous cavity, arise pain in the head, comatose affections, convulsions, delirium, disordered secretion of the liver, the stomach, the kidneys, the convulsive motions of ague, and increased action of the heart, which produces increased colour, temperature, and bulk of the external parts.

These symptoms, with some others arising from the same cause, constitute the *paroxysm*, viz. the cold and the hot stages of a fever.

The decline of the action of the heart, after increased action has continued for some time, is more or less perfect. When slight it is called a remission; when more perfect, an intermission. During the intermission the patient complains more or less of want of appetite, head-ach, and other marks of disordered state of the head, stomach, liver, &c. which were present before the increased action came on.

On the duration of the whole period, including the time of the increased action and of the remission, is founded the division of fevers into the quotidian, with a paroxysm in every twenty-four hours; the tertian, with a paroxysm in every forty-eight hours; and the quartan with a paroxysm in every seventy-two hours.

These distinctions are however arbitrary, and there is no such uniformity as their names indicate. We sometimes find the fever called quotidian returning two or more hours sooner every day. The period in these cases is evidently one of twenty-two hours or less, instead of twenty-four. In other cases the hot fit returns two or more hours later every day. This is evidently a period of twenty-six hours or more.

So likewise with tertians: they return sometimes two or four hours earlier or later every day. These periods are not indicated by the name, tertian: they are periods of forty-six or forty-four hours; or of fifty or fifty-two, instead of forty-eight.

These occurrences are so common that they have given rise to distinctive appellations, viz. anticipating and postponing tertians, &c.

The variations from the regular periods, indicated by the names, tertian, &c. are exceedingly numerous. The disease is called a true tertian when there is one paroxysm of twelve hours in every forty-eight. But the paroxysm very often does not continue as long as twelve hours and often lasts from twelve to eighteen hours—and as there is no real distinction between those that fall short of twelve hours, and those that continue for that length of time, neither can there be between the latter and those that exceed it. Sometimes every paroxysm after the first continues thirty-six hours, leaving only an interval of twelve hours: this Cleghorn calls a semi-tertian.

There are fevers with two paroxysms in every forty-eight hours, which are yet classed with tertian; sometimes both occur in the same twenty-four hours, at other times there is one in each twenty-four hours of the period of forty-eight. These are called double tertians.

In some double tertians the paroxysm does not exceed twelve hours; in others it continues longer; and in some it is scarce ended when another begins.

Sometimes there are three paroxysms in every forty-eight hours; in which case the fever is called a triple tertian.

After laboriously endeavouring to class fevers according to the definitions of nosologists, Cleghorn admits that they differ

so much that "it often happens that you can neither distinguish paroxysms nor intervals," &c.[1]

It is evident from this account that there is every variety of grade and of duration of the increased action of the heart, that can be supposed to arise from the varying state of the excitability of that organ in different persons, or in the same person at different times. That this is the real foundation of these varieties, is evident from the following considerations.

After a few paroxysms, the increased action gradually becomes less and less violent on every return; continues a shorter time, so that the interval becomes longer; and at length the period, instead of forty-eight hours, embraces seventy-two hours. Thus, the time of the return of the cold stage of a tertian is on every odd day, until the eleventh day, when it changes to the fourteenth, seventeenth, and twentieth, becoming in reality a quartan fever.

Here the same indisposition to increased action, in consequence of which the paroxysms become less and less violent, occasions at length longer delay in the renewal of the increased action, and the intervals become longer.

On the contrary, when tertians and quartans become quotidians, and quotidians remittents, the fever has its paroxysms protracted longer than usual before it changes its type.[2] Here the increasing excitability of the heart which protracts the febrile action, occasions an earlier renewal of it.

The same principle appears when we compare the relative duration of the stages of the different forms of intermittent fever. "With respect to the form, or type of fevers, this further may be observed, that the quartan, while it has the longest interval, has, at the same time, the longest and most violent cold stage; but upon the whole, the shortest paroxysm. That the tertian, having a shorter interval than the quartan, has, at the same time, a shorter and less violent cold stage, but a longer paroxysm. And lastly, that the quotidian, with the shortest interval has the least of a cold stage, but the longest paroxysm."[3]

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1 Cleghorn's observations on the diseases of Minorca, p. 147.

2 Cullen's First Lines &c. xxxi.

3 Ibid. xxx.

Here the same excitability that causes violent action of the heart, produces a repetition of the increased action at a short interval, as in the quotidian; and in the tertian and quartan, the violence of the action is proportioned to the readiness to commence it.

The difference between remittent and intermittent fevers arises out of the same difference of excitability of the heart. In intermittent fevers the blood is allowed to accumulate in the venous cavity in such quantity as to produce ague or convulsion; whereby it is impelled into the heart in such quantity as to rouse it to excessive action. It not being possible for this to last, in a few hours it sinks gradually down to weak action, and the blood again accumulates in the venous cavity. In proportion to the violence of the action is the length of time before the heart is roused again; and in very violent cases, after a few excessive paroxysms, the heart, with a profusion of blood pressing for admission, is insensible to its presence, and the patient dies in the cold stage.

In remittents there is greater excitability of the heart. The blood is not allowed to accumulate in such quantity as to produce an ague; but sensible to its stimulus the heart easily renews its action. The blood not being violently driven into the ventricle, the action is less rapid, the heart can bear it longer, is not so exhausted, sinks not so low, and begins again in a shorter time to act with increased force.

The difference of fevers, with regard to what are called malignant symptoms, grows out of the difference of the action of the remote causes. Those which act slowly and produce gradual accumulation of blood in the venous cavity, are attended by those symptoms which are effects of such gradual accumulation; while those which act rapidly produce sudden accumulation, and immediate increased action without those effects.

Thus, when a fever is produced by miasmata, this remote cause being gradual in its operation, renders the blood black, gradually lessens the pulse, loads the venous cavity, produces fulness and tenderness of the epigastrium, deranges the secretion of the liver and the stomach, and sometimes produces co-

ma and delirium before increased action comes on; and the blood being dark and therefore less stimulant than usual, when the increased action does commence, it is comparatively moderate, unless some remote cause which produces sudden accumulation, lends its aid.

But when a fever is produced by cold, this remote cause very rapidly reducing the action of the heart, the accumulation of blood in the venous cavity is very rapid, the quantity of stimulus suddenly presented to the heart is greatly increased, and the action of that organ must correspond; wherefore increased action or fever takes place, and the effects of gradual accumulation in the venous cavity cannot appear. Fevers thus produced are therefore very violent, but without stupor, convulsive motions, &c. except when the remote causes which produce sudden accumulation, act subsequently to those which produce gradual accumulation and its effects. In this case the malignant symptoms are combined with the violent, as in fever brought on by the exposure of persons who are under the influence of miasmata, to the operation of cold.

A number of chronic diseases proceed from the same causes that produce fever; and the connexion between the former and the latter, is evinced by the number of instances in which chronic disease follows a severe attack of fever, or in which it originates in seasons and situations in which fevers prevail.

In fevers produced by remote causes acting slowly, and therefore accompanied by various effects of accumulation of blood in the interior veins, many of these effects appear before the increased action; during the increased action they are somewhat moderated; but when it declines they appear again. When by repeated paroxysms, the disposition or ability of the heart to rise into increased action is worn out, some of these effects often continue. As they appear in every remission, or after every decline of the increased action they continue after the last, constituting various chronic diseases. Thus, after the decline of a fever, particularly if neglected or ill treated, we meet with effusions into different cavities, disordered stomach and liver, pain in the back, head, vertiginous affections, and convulsions.

These affections, like febrile action, are sometimes intermittent. Pain, convulsions, coma, &c. have sometimes regular periodic returns every twenty-four or forty-eight hours, unaccompanied by increased action of the heart. Senac says he has seen "a periodical cold fit, which was not succeeded by any appearance of febrile heat."[1] I have myself had cases in which the patient averred that he had had a chill, but no fever after it.

It is evident that in these cases there is some fall of the pulse at the time of the cold fit, and therefore some elevation from which to fall, and consequently an alternate increase and decrease of the action of the heart: the difference between these cases and those in which fever follows the cold fit, is only this; that in the former, the increased action rises no higher than to the ordinary grade of action in health, and then declines again until the cold fit appears. Thus is the cold fit periodic without any appearace of *febrile heat.*

In the same way, pains, convulsions, coma, &c. which are effects of a certain degree of accumulation of blood in the venous cavity, appear when the action of the heart sinks to that degree which produces the necessary degree of accumulation, and disappear when it increases again, although it does not arise to such a height as to be considered febrile action. The only difference between these cases and those in which the patient is convulsed at the access of the fever, or in every cold fit, is that in the latter, after the increased action has risen to that degree which is sufficient to lessen the fulness of the interior veins and relieve the convulsion, it does not cease to rise as in the former, but continues increasing until it is high enough to be called febrile action.

We have thus endeavoured to give an outline of an attempt to investigate the connexion between the remote causes and the symptoms of fever and of some diseases, by inquiring into the effects of those causes on the body; next into the effects of those effects, or new causes, and so on descending to the ultimate effects, the symptoms in question. Of the truth of the

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1 Senac on fevers, translated by C. Caldwell M. D.

leading features of the explanation there can be no doubt. The remote causes directly or indirectly weaken the action of the heart; weakened action of the heart is necessarily and immediately followed by accumulation of blood in the cava and its branches; this accumulation is obviously capable of producing the effects attributed to it. These effects moreover always occur in persons who show marks of the existence of such accumulation; the effects appear when the alleged cause is present, disappear when it is removed, and are lessened or increased with it.

ART. IV.—*Prodromus Florulæ Lexingtoniensis, secundum florendi ætatem digestæ.* By CHARLES WILKINS SHORT M. D. Professor of Materia Medica and Medical Botany in Transylvania University.

IT is proposed in the next and several succeeding numbers of this Journal, to give some account of the vegetable productions of the neighbourhood of Lexington and the circumjacent parts of Kentucky. The want of some such manual of practical Botany was much felt by the writer, whilst delivering a course of lectures during the last summer, to a small class of resident pupils, in the medical department of this school.

For, whilst *elementary* treatises on Botany are already numerous and daily multiplying, *systematic* works are comparatively rare; and as yet no local Flora of this section of country has been published. The Flora Boreali-Americana of the elder Michaux,[1] is so exceedingly scarce that I know of but one copy in the Western States; nor is Push's Flora Americæ Septentrionalis,[2] much more frequently met with. These, until very lately, were the only two standard works on American

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1 Published in Paris in 1803. 2 London 1814.

Botany, and although the excellent production of Mr. Elliott [1] has gone very far towards supplying the want of the two former, yet it does not altogether suit the Flora of this latitude. Moreover, works of this comprehensive kind are not so well suited to the capacity of beginners in the study, who, unaccustomed to the nice discriminations which distinguish one genus of plants from another, or the yet more minute shades of difference between the individual species, are confused and lost amidst the multiplicity of each which they meet with. "The Genera of North American Plants" by Mr. Nuttall, although invaluable to the proficient in the science and to the general botanist, is liable to the same objections for the mere tyro in the study.

It is true that in the Eastern States, many very cheap and good compendiums of systematic Botany have recently been published; as those of Drs. Bigelow, Barton, Darlington and Torrey. Of these the three first, however, are purely local in their character, being confined to an account of the indigenous productions found in the vicinities of Boston, Philadelphia and West Chester, Pennsylvania, and consequently are not suited to the investigation of these peculiar to this locality; whilst the last,[2] on account of its comprehensiveness, is liable to the same inconveniences attending the works of Michaux, Pursh and Nuttall.

To remedy in some degree these different objections to the otherwise excellent works just mentioned—works which no American Botanist should be without, is the object of the contemplated undertaking; which, at the same time that it will throw together, within a small compass, all, or the greater number of the plants of this neighbourhood, will do so without connecting them with associate genera and kindred species found in other parts of America. By this means, it is hoped that amateurs in the science throughout the Western country, but more especially the students of Botany in this institution, will

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1 A sketch of the Botany of South Carolina and Georgia in 2 vols. 8vo. by Stephen Elliott.—Charleston, 1821-24.

2 Flora of the Northern and Middle States, by Dr. John Torrey of New York.

be facilitated in their acquirement of a practical knowledge of plants, by having their attention directed to a fewer number; and be enabled the more easily to identify and name the individuals, when met with in their excursions around this town; while distant Botanists may form, from the sketch here given, some general idea of the local Flora of this part of Western America.

It is well known that the greatest difficulty which presents itself to the Botanical student, at the onset of his inquiries, is that of the *nomenclature* of the science; more especially when he endeavours, by reference to books, to ascertain the systematic name of any particular plant before him. For although, from his previous knowledge of the elements of the science, he may be at no loss, by a mere inspection of the flower, in saying to which *class* and *order* in the Linnæan system it belongs, yet he must refer to systematic writings to discover its *genus;* and if, from some obvious and well defined character, he should be so fortunate as to ascertain its generic title, still a farther difficulty awaits him in fixing upon the *precise species* it may be: and if the genus should happen to be an extensive one, embracing a great number of species, his labour will be proportionably increased, before he arrives at a knowledge of the name of his plant.

In consequence of these difficulties attending the nomenclature of the science, all Botanists have regarded it, as a remarkable epoch in the history of their studies, when, unaided by the helping hand of a preceptor, they have first discovered the proper name of a plant, before unknown to them. The elder Barton,[1] whose name justly stands at the head of American Philosophical Botanists, has frequently dwelt, with peculiar delight, on his first achievement of this object; and I shall never forget the ecstacy with which, after wading through the voluminous class Pentandria, in the "species Plantarum" of Linnæus, I was enabled with certainty to designate an inter-

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1 Benjamin Smith Barton, M. D. late Professor of the Institutes and Practice of Physic, of Cliuical Practice and Botany in the University of Pennsylvania.

esting little plant, the object of my search, to be the *Claytonia Virginica.*

It is in this manner then, that local Floras are especially useful to the student of Botany, in facilitating his acquaintance with the vegetable productions more immediately around him. In treatises of this kind, descriptive histories are given of those plants only which are found growing in particular districts of country, separate and apart from those, however nearly related to them, which are met with in other parts of the same country, or are found throughout the world. Thus in the "Florula Bostoniensis" of Bigelow, there are described *seven* species of the genus viola; in the work of Pursh, we find *twenty-two* species enumerated, as growing in different parts of North America; whilst in the latest and most comprehensive systems of general Botany, there are designated *seventy-eight* species of this generic family, now known in different parts of the world, and the number is still constantly increasing, as heretofore unexplored quarters of the globe are visited by naturalists. So comprehensive, indeed, is this humble genus, that Sir James Edward Smith does not hesitate to say, "that a full scientific botanical essay on Viola, might display as much skill and learning, and be made subservient to as much philosophical illustration of Botany, as any monographical subject that could be chosen." [1] It is then plainly apparent, that the Boston student would be enabled to ascertain and identify any one, or all the violets growing in the neighborhood of that place, by reference to the work of Dr. Bigelow, with far more readiness and certainty, than if he were to consult the extensive Flora of Pursh, or the yet more general systems last mentioned—the comparative difficulty in the latter case being as seventy-eight to seven. So with any other individual plant, and so with the whole Flora of any country.

For the purpose of aiding the student still farther in his first acquaintance with the scientific nomenclature of plants, some peculiarity in the arrangement of the subjects of his investigation, as well as in the description of each one, will be found in the proposed publication.

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1 Rees' Cyclopedia, vol. 23—article, Viola.

In the first place it is intended to arrange the plants described in the Florula Lexingtoniensis, neither according to the artificial system of Linnæus, nor the natural method of Jussieu; but in the *order of their seasons of flowering*, constituting it thus properly a Calendar of Flora. This disposition may be objected to by some, as being both unnatural and unscientific; since by following it, those plants most nearly allied botanically, may be widely separated: and even two species of the same genus, one of which may happen to bloom in March and the other in November, will necessarily be placed at the opposite extremes of the catalogue. The inconvenience is seen and the objection granted, but they are both willingly incurred for the purpose of promoting the object more immediately in view—that of facilitating an acquaintance with the science of Botany, by enabling its student in this institution to become familiar with its technicalities, in the easiest and shortest manner possible, and practically conversant with the vegetable productions of this neighbourhood, by offering him descriptions of the plants in the same order in which they are presented to him by the hand of nature. The advantages gained by this arrangement in acquiring the names of plants will, I hope, appear from a single example. The class Pentandria, the fifth of Linnæus, being by far the most comprehensive of the whole system, the species ranged under it must necessarily be numerous even in the most limited Flora, and in proportion to the number of descriptions which he has to examine, is it the more difficult for the Botanist to identify any particular one with the specimen before him; hence I have known many students, by no means deficient either in patient research, or the "ardor botanicus," to throw away a pentandrous plant, in utter despair of ever being able to distinguish it from among its numerous classmates. But if the individuals of this extensive tribe are separated, and present themselves one by one in the order of their inflorescence, the difficulty of encountering and naming them will be at once abridged. In farther evidence of the advantages of the plan proposed, I may observe, that even the *umbelliferous* subdivision of the 5th class is itself so extensive, and the individuals composing it, are characterised by such

nice shades of distinction as to perplex even the veteran proficient in the study. The task must then be a hopeless one for an inexperienced novice; but if he finds amongst the snows of March one solitary species of the pentandrous class, and discovers it to be umbelliferous, and, on consulting his vademecum, he finds, at the beginning of the list, one only individual of the kind described under the name of *Erigenia bulbosa*, he has no hesitation in saying that this is the plant in question. In this manner are the vernal species easily distinguished from those which bloom in mid-summer, and these again from the autumnal.

In the next place, will be given the *derivation* of each *generic* name as the genera occur, and the fact will be stated when the name is gratuitous or its derivation fanciful, obscure, or unknown. It has been objected to the science of Botany, that its technical appellations, both in its elementary and systematic departments, are unmeaning, harsh and arbitrary, couched in hard latinity or yet more uncouth derivatives from Greek. To the language of the science in its elementary, anatomical or physiological branches, the present essay has no reference; a defence of these being more properly the province of the lecturer or writer on its elementary principles; but of the systematic names applied to individual plants, it is but fair to state, that this nomenclature, if not equally concise and explicit with that of modern chemistry, is much more so than the chemical vocabulary of the last century, and is as definite and intelligible to the novice as the language of anatomy, at this time, in describing the various muscles and other component parts of the human body; and yet no body objects to these anatomical names.

By giving, then, a few words of explanation in regard to the title of each genus, we hope in some measure to do away this objection to the science, and, at the same time, to impress more deeply these names upon the mind of the student. Thus the title given to a very beautiful and extensive genus of North American plants, some of which are medicinal, is *Asclepias;* which to the tyro might seem at first sight altogether unmeaning or arbitrary; but when he is informed that it is derived from

Æsculapius, the propriety of the dedication is at once seen, and is more likely to be remembered: and so with the most of those generic denominations obtained from proper names. Still more appropriate and intelligible are those afforded by some conspicuous property or character in the plants themselves, as in the Latin derivatives *Convolvulus*, *Sanguinaria*, *Lactuca*, *Sempervivum*, *Trifolium*, &c. or those of Greek extraction, as *Epidendrum*, *Hydrophyllum*, *Helianthus*, *Padophyllum*, *Cardiospermum*, *Dracocephalon*, *Polygala*, &c.

Thirdly.—The *class* and *order* of the genus in the Linnæan system will next be given; but as this treatise presupposes an acquaintance with the elements of Botany, or at least with the principles of the sexual system of that naturalist, no explanation of his system will be here attempted.

Fourthly.—The *description of the genus* will follow; but, as the arrangement proposed will necessarily lead to a separation of the different species of the same genus, to avoid repetition, the generic character will be given before the *first species* of that genus; and the genera and species being both numbered, the character of the former can easily be referred to, when any subsequent species present themselves.

Fifthly.—Next will follow some *particular species* of the genus under consideration, but as the different species of the same genus often bloom at very different seasons of the year, they will be met with in different parts of the Florula, according to the periods of their efflorescence. The distinctive names given to these different species are, for the most part, so characteristic, that their meaning is at once apparent, and requires no explanation; as Asclepias *tuberosa*, Lactuca *virosa*, Helianthus *annuus*, Trifolium *repens*, &c. Where, however, the sense of these specific appellations is more obscure, it will be explained.

Sixthly.—Then will be given, in as few words as are consistent with perspicuity, a *description of the species*, adding some of the more common synonyms by which the same plant may have been described in different books.

Seventhly, and in conclusion, some *general observations* will be made on the individual under review, noting any striking peculiarity, when such is offered, by which it may be at once

distinguished from other plants, or from other species of the same genus—the particular locality in which it may be found—the exact period of its being first in general bloom—the duration of its florescence—the ordinary time of ripening its seed or fruit, and finally its application to œconomical, dietetic, or medicinal purposes.

It is by no means intended that this sketch shall embrace a complete Flora of the Lexington country; such an undertaking would very far exceed the limits which could be allowed it, in even four numbers of this Journal. The whole design of the proposed publication, is to aid the advances of the novice in the science, by presenting him with a manual or horn-book in Botany, which will point out to him in the clearest manner possible, those plants which are more commonly met with in excursions of a few miles around this place; and of these, those only will be described, which are more likely to obtrude themselves upon the notice of the observer. Hence many of our trees, whose blossoms are obscure, together with the greater number of the gramineous plants, and all the cryptogamous productions, will be excluded.

Such being the plan, and these the objects in view, it would be deemed superfluous to ask the indulgence of the scientific and minute Botanist for the numerous imperfections and omissions which will doubtless be detected in the ensuing numbers. It will be the groundwork merely—the bare outline of the natural history of this section of country, in one of its most interesting departments. At some future day, the work may assume a more imposing character, when the humble florula becomes, by farther observations and additional labour, converted into the more comprehensive Flora. In its forth-coming guise, as repeatedly observed, it is merely intended that *indocti discant*:—the *ament meminisse periti*, must be reserved for its future form.

ART. V.—*Remarks on Cholera Infantum.* By JOHN P. HARRISON M. D. of Louisville, Kentucky.

In the whole class of those kindred diseases, which in their summer and autumnal visitation annually afflict different parts of the United States, there is not one, which, in ordinary years, demands a higher degree of attention, except bilious remittent fever, from the medical practitioner, than cholera infantum.

It is the main outlet to the lives of a great many children every year; and when the rest of the community is comparatively healthy, its ravages invade the sanctuary of infantile feebleness, and sweep the fond anticipations of parental love to the grave.

It has been long since remarked by the discerning Cleghorn, that vomiting and purging, with periodical fever, often of the erratic kind, without any fixed type, attack young children early in the summer—and that in consequence of children suffering more from the season than adults, they are invaded earlier by disease.

It is a fact verified by repeated observation, that the approach of a violent epidemic is frequently indicated by the violent seizure of children with cholera, and convulsions. I witnessed a striking confirmation of this fact in 1822. The onset of the terrific epidemic which desolated our town and its neighbourhood in the summer and autumn of that year, was first seen in its attacking children in the form of cholera and convulsions.

But in ordinary years the amount of mortality may be graduated by the *intensity* and *duration* of high atmospheric temperature, as I shall presently attempt to show.

Such is the mortality of cholera infantum in the city of Philadelphia, that Dr. Meigs computes that about one third of the

deaths among children is occasioned by this disease alone. In the absence of contagious diseases, such as pertussis, and measles, there seems to be a greater mortality among the children of our town produced by the disease, than the computation of Dr. Meigs evinces with regard to Philadelphia.

In the summer of 1821, I saw several cases in which there was a complication of hooping-cough with cholera in children, in every instance of which a fatal issue took place.

Among the several remote or predisposing causes to which the origination of this disease has been ascribed, I will notice the most prominent and operative. 1st. *Atmospheric heat*—The mode in which high temperature of the atmosphere brings on attacks of cholera is involved in some controversy. The contrariety of view, given by different writers, concerning the manner in which external heat operates in producing bowel affections, need not delay the progress of this discussion. The novelty, and apparent coincidence with nature, of Johnson's explanation by the "cutaneo-hepatic sympathy," which Dr. Armstrong has termed one of the happiest efforts of modern pathology, has subverted the former opinions entertained on this point. But it becomes us, as inquirers after truth, to pause in the midst of our precipitate adoption of any statement, which we are likely to receive rather implicitly from the blandishments of a seductive theory. One thing we know, that in the medical agency of opium, we have presented to us a direct contradiction of this theory. Johnson says, there is a *synchronous action* established between the increased secretion of bile and the augmented secretion of perspiration, "from the cradle to the grave, from the equator to the pole;" and that *heat* applied to the surface, will invariably manifest, in its influence on the system, a simultaneous excitation of both the skin and liver. When we give opium, and the state of disease does not interfere with its intended mode of operation on the system, we diminish the secretion of bile, whilst the skin is excited into augmented functional action.

After a full dose of opium, we generally find that there is an entire absence of bile in the alvine excretions; and as long as the system remains under its narcotic influence, the hepatic se-

erction appears suspended, whilst the skin is often bathed in sweat. But as Dr. Johnson restricts this synchronism of functional action between the skin and liver to the agency of heat, I will offer one or two facts which evidently countervail this *universal* proposition. When a patient is labouring under bilious diarrhœa, we frequently see the skin cold, and deficient in action. Diarrhœa, accompanied with discharges of bile, is often occasioned by cold applied to the skin. Many persons are subject to this variety of bowel complaint whenever they get their feet wet.

The fact is, that very often sweating is but an *evidence*, and not a *cause* of the subsidence of disease.

The precise mode in which atmospheric heat predisposes to intestinal derangement, would appear to be the following. There is an intimate relationship of function between the stomach, with its dependant organs, and the surface. In cold weather the power of digestion is increased by the tone imparted to the stomach from the tonic influence of moderate cold on the skin. In hot weather there is a diminution in the power of the stomach, produced by the action of heat on the skin. The lessened appetite, greater liability to constipation of the bowels and decrease of peptic energy, which are felt in ourselves, and noticed in others, during the summer season, convince our judgements that the first depreciating influence which atmospheric heat exerts on the functions of the abdominal organs, is by its agency on the stomach, imparted through the skin.

Dr. Mann, of New England, in 1804, published an Essay on Cholera Infantum, which is reviewed in the 8th vol. p. 310, of the Medical Repository of New York, in which he introduced the first link of the chain, which Johnson has so ingeniously wrought.

"By a previous stimulation," says Dr. Mann, "by excessive heat, the liver falls into a torpid condition." "Thus," continues the doctor, "heat is the remote cause; a torpor of the liver, induced by the excessive excitement of that active agent, an intermediate cause; and a superabundance of acids in the alimentary canal, in consequence of defect of gall (bile) is an immediate or proximate cause."

The explication set forth above, by the present writer, as regards the manner in which heat operates in the creation of an increased susceptibility in the intestines to deranged action, will receive an additional support from a consideration of the physiological relations of the stomach and other chylopoietic viscera.

The mucous system of the ventro-pulmonary apparatus, as lucidly demonstrated by Bichat and Broussais, pervades the stomach, intestinal tract, ductus communis choledochus, ductus cysticus, hepatic ducts, pori biliarii and acini. As a living membrane, endued with similar organic laws, every part must be operated on by those agents which excite into action any other portion. Thus heat influencing the stomach, as noticed above, the impression will be either simultaneously felt by the acini, the proper secreting portion of the liver, or else the action will be propagated from the stomach to the liver, by what Mr. Hunter termed continuous sympathy. Whenever the functional activity of an organ is diminished, there is a corresponding less demand for blood, the pabulum out of which the secretions are formed.

The abdominal organs during warm weather, and in hot climates, being debilitated, have less blood circulating in them, with the exception of the liver and spleen which have more, than in a colder atmosphere. The spleen and liver are organs whose office is, in several aspects, peculiar. The spleen is, perhaps, altogether intended for a reservoir, or as Rush called it, "a hand basin" to receive the blood which might be too injuriously thrown on the other viscera.

The liver undoubtedly answers a similar purpose, and Broussais has placed both among the erective tissues, because he saw them subserving such a purpose. But the liver is a transmitting organ likewise, as the venous blood of all the chylopoietic viscera passes through it to reach the heart.

There being a loss of balance in the distribution of the blood in the abdominal viscera, the liver and spleen are often surcharged—the consequence is, that an enlargement of the spleen, and augmented secretion of the liver, are so often felt and seen in hot climates. By keeping the elements of physiological

knowledge in view, we may thus explain phenomena in health and disease, without seeking the dubious light of some mystic principle, or taking up an isolated fact for a general law.

That temperature is almost alone the general predisposing cause of cholera infantum, is rendered obvious from the following facts. 1st. The disease occurs as an infantile epidemic upon the accession of hot weather in the early summer months. 2d. It declines towards the fall of the year, when bilious fever, among adults, prevails. 3d. It occurs both before and after the period of dentition.

We may assume it as a good general axiom in medicine, that whenever a disease prevails epidemically, that is over an entire community, it must have its origin in some general operating cause.

Therefore, as this disease often spreads to a great extent in a town or city, and as its rise is obviously connected with the accession of hot weather, we may safely refer to that powerful agent for its production.

Besides atmospheric heat, the disease has been attributed to *cold*, *dentition*, *unwholesome ingesta* and *worms*.

The affection of the bowels in children induced by exposure to cold in winter, is a mild disease compared to cholera. I do not think that alternation of temperature is liable to produce the disease as much as intense heat, protracted for several days and nights. Dentition may aggravate the disease when existing, and may even act as an exciting irritant in developing it, but as it often is seen anterior to the period of dentition, this can only be considered an adventitious circumstance.

The most fatal time of the child's life at which the disease appears, is the second summer of its existence. This fact receives a ready solution in the reflection, that as children are generally weaned after the first, and before the second summer of their lives, so the change which takes place in their ingesta from the bland milk of the mother to a diet ordinarily composed of a heterogeniety of articles, inflicts incessant irritation on their tender stomachs, now weakened by the accession of warm weather. Children during cold weather, may undergo cholera crapulosa from excess in the quantity of ordinary diet, or from

the badness of the quality of their food, but with the evacuation of the ingesta, the irritation thus created, ceases. There is no perpetuated diseased condition of the stomach and bowels, no vitiated secretion, or suspended functional action of the liver, and no depraved state of the surface, kept up for days in despite of evacuants.

As to intestinal worms being in any way concerned in the production of cholera, there is no just foundation. When a child is attacked with the disease, the lumbricoid variety of worms pass away, sometimes by the mouth in the vomiting which sometimes ushers in the complaint, but more frequently, are expelled, or rather escape per anum.

The disease may come on with a purging, without vomiting, or the vomiting may supervene after purging has commenced; often the attack is ushered in by both emesis and catharsis.

In the worst forms of the disease, the child is at first languid and sluggish, a slight febrile heat is manifest, the thirst is greater than natural, and the bowels may be torpid. The vomiting and purging come on with increased heat of the skin and fever, the ingesta recently taken are thrown up with the fluid drank, and the fœcal matter, already in the bowels, is evacuated. As the alvine discharges become more frequent, tenesmus and tormina, evinced by the writhing and screaming of the little sufferer, with straining, and a forcing out of the lower end of the rectum, take a prominent place in the catalogue of symptoms. The vomiting is repeated whenever any fluid, even the mother's milk, if the child is at the breast, is swallowed. The patient cries and frets for water, points to the vessel, convulsively snatches it when brought near the lips, and hastily swallows it down.

The evacuations by stool now become thin, and colourless, or slimy, tinged with blood, at times with a slight colouring of bile: in the worst cases, there is no appearance of that secretion.

The bowels, in the progress of the disease, when in its downward march towards a fatal termination, are in a high state of irritation, with coldness of the surface; the abdomen and head are hot to the touch, the tongue white and furred, the

child's countenance assumes a settled cast of gloom and fretfulness, it moans out a feeble cry, the stools are squirted out or forcibly ejected, with straining, great prostration ensues, incessant restlessness, and sometimes convulsions close the scene. Symptoms, simulative of dropsy of the head, often draw over the above dark and melancholy picture, the curtain of death. But although I once thought, that in every case, where the disease terminates fatally, with symptoms indicating great sensorial disturbance, that the patient dies hydrocephalic, I am disposed to doubt the correctness of that inference. I regret that I have never had an opportunity of testing the soundness of either opinion, by opening the heads of children dying of this complaint. But when we reflect upon the great cerebral derangement which obtains in adults, and especially in children, when there is much irritation in the stomach and bowels, our minds will be brought into at least a reluctance in admitting that in *all* cases, a child dies of dropsy in the brain, when there exists in a distant organ, a sufficient degree of irritation to account for the symptoms of diseased encephalon present.

Ingesta often, and worms sometimes in children, produce convulsions, strabismus, and a comatose state. That the functional action of the brain may be much disturbed, without structural lesion, the following case of pathological anatomy will show.

A man, of fine constitution, was last summer brought from the canal into the Louisville Hospital with bilious fever. He seemed much alarmed, but his case did not put on a very malignant appearance. He was bled and purged by the attending physician to a considerable extent. He had been bled at Shippingport, before his admission, quite liberally. His brain seemed, from the commencement of the attack, to be considerably affected. A consultation was held on his case, the day before he died. There was a division of sentiment about the case, as is usual among men when we are puzzled by a difficult and recondite subject of investigation. At the time of the consultation, the man was slightly delirious, had dilated pupils, with subsultus tendinum, open compressible pulse, with a skin

of healthy temperature, and tongue tremulous to a great degree, whenever he attempted to protrude it from the mouth.

After his death he was opened. I had given my opinion before he died, that his brain was only functionally affected from the general state of the system; but when told that he died in convulsions, I felt disposed to retract my opinion, and admit the correctness of the view taken by my respectable colleagues. But the dissection proved the soundness of my first opinion, as there was not the least appearance of inflammation in the brain, or its membranes. Yet I was mistaken in a previous supposition, of the entire absence of inflammation in any one organ; for the intestines manifested signs of inflammation in their upper portion. It is a familiar phenomenon which surgeons witness every day, that when the constitution receives some sudden shock either from a concussion, or operation, the nervous system sinks under the blow. Sir A. Cooper and Mr. Travers have given us some striking cases of this kind. Analogous functional disturbances occur in the brain whenever any sudden irritation is developed, especially when such an irritation arises in the excitable system of a child. The intensity of such cerebral derangement must be graduated by a ratio, compounded of the physiological relations of the organ suffering under the irritation, and the susceptibility of the individual, from age, or sex, or peculiarity of constitution, to be affected by such sympathetic excitement. I by no means deny the reality of such an occurrence, as dropsy of the brain supervening on cholera infantum; but the verity of the supposition that in all cases of the sudden termination of the complaint in symptoms like those of hydrocephalus, we are to infer the presence of water in the brain, or even active inflammation of the encephalon, is what the foregoing observations are intended to disprove.

More commonly, however, the complaint takes on a milder type than that described above. The seizure is marked by only slight vomiting, or without any vomiting at all, with frothy loose stools, little fever, slight restlessness, some thirst and defect of appetite. If any food is taken by the patient, it passes nearly unchanged through the bowels, adding to the irritation

already existing. In young children at the breast, even the mother's milk is thrown up slightly coagulated, or is evacuated per anum in a similar condition. The flesh and plumpness of the child fade rapidly away—the eyes assume a sunken appearance, and are of a glassy aspect—or the child as it dozes, keeps them half open and seems insensible when a fly lights on them—the corners of the mouth are puckered up by the contraction of the levator anguli oris—the abdomen is tense—the skin of the thighs becomes loose, flabby, and wrinkled—an extreme degree of emaciation succeeds in the progress of the disease, the bones of the hip and other pointed processes, push through the skin; aphthæ arise in the mouth, fauces, and throat, which appear to pervade the entire intestinal tube and excoriate the anus, and the child gradually sinks, till released from its protracted sufferings by death.

The sketch given of the complaint in its severer and milder forms, doubtless needs a more exact filling up by the details of a more minute and circumstantial relation. But it were an utterly unattainable attempt to pourtray every variation in a disease, which can only be adequately known and comprehended by personal observation. The confused accounts given by some of the types, or diversities of cholera, may puzzle, but can never enlighten the reader.

The science and practice of medicine are laid in a knowledge of the subject of disease, and the agents to act on the subject. Practical skill is grounded on a correct appreciation of the kind and degree of departure from health in any given case, and the suitableness of the remedies at hand to work a change in such aberrations.

Should the physician have a correct view of the pathology of the case, he can fairly appreciate every variation in the aspect of the disease; but he surely would no more think of multiplying divisions because of the fluctuations thus rapidly passing before him, than he would of distinguishing a person by different names on account of the changes which his countenance undergoes, from the agitations which rise within his breast. We know the identity of the man by his fixed personal features—so we recognize a disease by certain habitudes and

characteristics which it possesses, and having come to a conclusion as respects its nature, we then build our indications on such knowledge. Our indications in cholera infantum will arise from the views entertained of its causes and nature. As we cannot remove the great remote agent which operates in its production, we therefore cannot prevent a predisposition from being engendered. But we may remove the exciting causes, and direct our remedies to the fulfilment of indications for the cure.

The first indication is, to remove the exciting cause, whatever it may be. The second is, to restore the natural functional action of the stomach, bowels, liver and skin. And the third is, to sustain, when restored, such healthy action.

To fulfil the first indication, several considerations should be attended to. If painful dentition, indicated by swelled gums, and great heat about the mouth, acts as an irritant, we must freely and repeatedly incise the gums. It is a mistake to suppose that frequent incisions interrupt the progress of the tooth through the gum by creating a cicatrix; for the fact is, that a newly formed part is always more easily absorbed than the original parts. I have often known children seem pleased after this simple operation, from the relief afforded them. The membrane covering the tooth must be cut, or the intended advantage is not secured.

Should ingesta, such as fruit, vegetables, or any other article of diet be the irritant, we must give a gentle emetic, such as ipecacuanha, or provoke emesis by warm water. As errors in diet are the most frequent exciting cause of the attack, we should be extremely wary and vigilant on this point. If suppressed perspiration be indicated by the state of the skin, the surface of the body being dry and hot, we may very advantageously give the ipecacuanha, whether or not there is evidence of any crudities in the stomach.

The second indication is of more difficult fulfilment. The exact state of an organ in disease, is not easily comprehended. We may speculate with geometrical precision about congestion, and elaborately discuss in set phrases, the state of excitement and excitability, yet after all we find that the laws which gov-

ern vitality, are constantly varying in their mode of operation. Consequently we can never arrive at any just conclusions about the diseased condition of an organ, unless we take this essential feature of animal life into our computation.

The first impression made on the stomach of a child predisposed to this complaint, is by atmospheric heat. A child, however, may escape by great circumspection in diet and clothing from an attack of cholera. But some foreign irritant being applied, or the predisposing cause acting with such intensity as to become likewise the exciting, the stomach is roused into morbid action.

The first link of the chain of morbid movement is irritation, causing suspension of the healthy functions of the stomach; then quickly succeeds increased determination to the deranged part, the function of the liver is involved in the train of diseased action, the skin sympathises; the stomach and bowels are reflectively acted on by these accessory disturbances of the liver and skin, and so the disease is perpetuated.

Should the irritant, exciting into action the predisposition, be directed to the stomach, the above regular concatenation will ensue. But suppose the exciting cause acts on the skin, such as suppressed perspiration from cold, then we have an increased centripetal movement of blood on the internal organs, with an additional irritation of the stomach and bowels, from the intimate consent which obtains between the skin and these organs.

To fulfil the second indication laid down, that is, to restore, the natural functional action of the stomach, bowels, liver and skin, or in other words, to calm the irritation of the stomach, and promote the secretions of the liver and skin, is often of difficult attainment. The first remedy which offers itself to notice is an emetic. The operation of an emetic has something tranquillizing in it which is not easily explained. Vomiting induced by art, has a powerful agency in restoring the secretory action of the capillary vessels of the surface, and thus carrying off febrile excitement. Besides, the whole abdominal viscera are agitated by the efforts of the stomach, and co-operating muscles, to eject its contents; the liver is roused

into a secretion of bile, and the contents of the gall-bladder are emulged and thrown up. But besides such apparently mechanical effects, there is a peculiar impression produced on the nervous system, which, I cannot now stop to inquire into.

In ordinary cases, if called in early, I commence with ipecacuanha. Some practitioners of standing prefer tartar emetic, but its operation is rather too severe for very young children. It certainly appears to have a more influential agency in acting on the skin and liver than ipecacuanha. Dr. Chapman mentioned that he had seen several deaths induced by the depressing effects of tartar emetic on the systems of young children, and that able practitioner admonished his class against its too liberal employment in the diseases of infancy.

In the severer forms of cholera, where the vomiting has continued several hours, and the skin is at, or below the healthy standard of heat in children, and where the alvine discharges are thin and without a feculent smell, I never adventure on exhibiting an emetic at all.

In 1820, I gave one of my own children ipecacuanha with great disadvantage, which ran off by the bowels as it entered them, producing no sort of secretion from the liver. He was saved by putting the system under the narcotic influence of opium, combined with calomel.

The safest practice in the majority of cases of cholera, is that pointed out by two eminent men in the profession. Dr. Ayre of England, and Dr. Dewees of Philadelphia, both distinguished for their superior practical skill, have recommended the same mode of treatment. As this is a very important point in the discussion, I will copy what they advance on the subject.

Dr. Ayre in his excellent little work on the liver, after speaking of restoring the secretion of that organ by calomel, as well as moderating the excessive production of a vitiated secretion from the liver by the same remedy, continues thus: "In the following cases, it will be seen that the practice pursued, in the treatment of the cholera morbus, consists in giving a third, or a fourth part of a grain of calomel, according to the age or other circumstances of the patient every half hour, for five or six successive hours, or until the sickness abates; and with such

success in renewing the secretion when interrupted, or in lessening it when excessive, and in allaying the sickness consequent upon these states, as rarely to require, excepting in cases of unusual severity, a continuance of the medicine beyond the sixth or eighth dose. To those accustomed to consider calomel to be only useful when administered in large doses, because it requires to be so employed in puerperal inflammation, and some other acute diseases, the minute quantities here given, may be thought perhaps unlikely to be efficient; but to such it may be observed, that, until we know something more of the manner in which this medicine acts, it is impossible to determine by any other rule than actual experience, the dose required to render it available for any specific purpose." p. 174.

Dr. Dewees, in his work on children, says, "We first prescribed this remedy (calomel) in doses of half a grain, or an eighth of a grain in cholera, in the year 1795, and were, by some of our medical friends, severely ridiculed, for the supposed insufficiency of the dose. But this did not deter us from the practice; for we have pursued it from that period until the present moment, though we could then gain but few to our opinion. Since, however, Dr. Ayre has written on the subject, it has got into general use. We never combine opium with the calomel in the early stage of the disease; being convinced it is better to exhibit it alone. The following is the form and average dose we use:

R. Calom. ppt. gr. iij. Sacch. alb. gr. vj. M. div. in par. xij.

"One of these powders is thrown dry into the child's mouth, every hour, until the bowels are decidedly operated on by them; this may be known by the stools being more copious, less frequent, and of a dark green colour, with a tenacious slime of the same or nearly the same tone of colour." p. 402.

The milder preparations of mercury, have a powerful tendency to allay the irritability of the stomach in this affection. Calomel is the best medicine when properly administered. The blue pill is a very useful article, and by some practitioners preferred to calomel. I have tried the method of giving calomel as directed by Drs. Ayre and Dewees, as well as the one suggested by Cheyne, and at times have given the remedy with

more boldness than as prescribed by the last author. When there is a hot skin, with full pulse, great restlessness, very vitiated discharges, either exceedingly fetid and slimy, or thin and destitute of odour, I prefer large doses of calomel to small ones; because the design is to reduce excessive action, and pave the way for a more alterant plan. If the stomach will retain oil after the calomel, it may be advantageously administered. However, if the stomach is very irritable, the small doses, with the positive interdiction of fluids, except a thin gruel made of parched corn meal, will accomplish more than the full doses. When there is a coldness on the skin, weak, quick pulse, with much tossing of the head, the warm bath, stimulating embrocations to the abdomen, and calomel combined with opium, are the proper measures for restoring the centrifugal action of the system, and emancipating the stomach and liver from their embarrassed condition. In such cases the oil of turpentine promises to be very useful; and Dr. Dewees says he has given it with great benefit. To a child of a year old, from six to twenty drops, according to the urgency of the case, in a little of the meal gruel sweetened, may be given three or four times a day. Injections of starch, with or without laudanum, are very beneficial. They relieve the tormina and tenesmus, but are designed only for a temporary purpose; and should not be too frequently repeated, on account of the soreness induced by the frequent introduction of the pipe of the syringe. Blisters, when the fever is not too high, are to be applied over the abdomen, and upon the inner part of the thighs. But great caution is necessary in using blisters, for the tenderness of the skin is such, that cases have occurred where mortification has resulted from excess of the inflammation created by their application. If the stools are green and frothy, indicating acidity of the primæ viæ, magnesia, or carbonate of potash may be given. The following is a good formula.

R. Carb. potass. gr. xx. Sac. alb. gr. xx.

Tinct. Cin. drachm. 1. Aquæ font. unc. ij. M.

A table-spoonful every two or three hours. Lime-water and milk answer a similar purpose. If there be much straining and pain, we must return to the calomel. There is no remedy that

is so influential in restoring the secretion of the liver, and none that equals this most efficient medicine, in overcoming the irritable movements of the intestines. We must take care not to purge too much. After having evacuated the bowels thoroughly, we may call in the aid of the chalk julep, sugar of lead, and opium, decoction of dew-berry root, or any such astringent remedies. Of these remedies, except the decoction of the dew or blackberry root (rubus procumbens and rubus villosa,) I know nothing from personal trials of late years. I formerly deluged the stomachs of my little patients with phial after phial of chalk julep, but have entirely laid it aside. Dr. Mann and Dr. Chapman, both have spoken favorably of the sugar of lead, but I have never tried it. My friend Dr. Rogers of this place, in whose practical skill I have much confidence, says, that to correct the fetor of the discharges he has found nothing so useful as charcoal. The remedy has perhaps likewise, a favorable influence in calming the irritability of the intestinal tube. He gives it in doses of a teaspoonful every two or three hours, or not so often, as the case may demand. Dr. Chapman advises the supersulphate of iron as a good astringent and tonic in the latter stages of the disease.

R. Sal. Martis gr. ij. Acid. Sulph. gtt. x. Sacchar. alb. drachm. j. Aquæ font. unc. j. M. The dose 20 or 30 drops.

But my main dependance in accomplishing the cure, after mercurial evacuants, is a combination of calomel, opium, and ipecacuanha.

R. Calomel. gr. ij. Opii gr. 1-2. Ipecac. gr. 1-2. Sac. alb. drachm. 1. P. Gum. arab. unc. 1. M. Make six powders, one every three or four hours.

The ipecacuanha can be omitted, whenever there is much irritability of stomach, or defective action on the surface. The introduction of the combination of calomel and opium in the treatment of this disease, we owe to Dr. Miller of New York. The addition of ipecacuanha, is useful to promote the functional action of the skin; whilst the opium calms the excessive irritation of the stomach, the calomel acts on the hepatic system, and the ipecacuanha determines to the surface. Thus our second indication is fulfilled in this combination.

The sulphate of quinine may be given with great advantage, when the disease has become chronic. The following is a good formula.

Sulph. quin. gr. ij. Pulv. Cinnam. gr. x. M. make 8 powders, one every four hours.

This medicine imparts tone to the stomach, and sustains in a more natural manner the healthy secretion of the bowels, than any other article, with which I am acquainted. A flannel roller over the bowels, should not be neglected. The equable pressure and temperature which the roller occasions, are of great utility in the latter stage of the disease.

The cold bath I have but rarely employed, and though it may be beneficial when much febrile excitement prevails, it is certainly counter-indicated in the prostrated state of the system, which obtains in the last stage. There is a vegetable astringent which is one of the most useful remedies I have ever tried in the colliquative diarrhœa, which often succeeds cholera. It is a strong decoction of the sweet gum tree bark, (liquidambar styraciflua) sweetened with loaf sugar, and given freely. Sometimes the child in the latter stages of the disease, has an appetite for some *outre* article of food, or drink. Dr. Rush mentions several instances of the kind, in which the patients recovered by indulging them in their appetite. I knew a child, who was apparently in articulo mortis, for whom I ordered whiskey and water; but it would drink nothing but the undiluted spirits, and rapidly recovered.

Every thing else proving abortive, Dr. Rush directs the patient, if living in a town or city, to be sent to the country. The temperature of the air in a town or city, is several degrees higher than in the country; of course this measure is proper. Gestation by swinging, on horse back, or in a carriage; frictions over the abdomen and limbs with the hand, are very well calculated to restore the centrifugal action of the circulation, and enliven the functions of the skin, stomach and liver.

The best drink, when the stomach is irritable, is the roasted meal gruel, or a cold infusion of the benne leaf, (sesamum orientale,) or slippery elm bark. But little should be given at a time, or the vomiting will not be easily appeased.

The diet should be very light—rice boiled or parched, flour grated in boiled milk with loaf sugar, tapioca, and such articles are proper.

Good Irish potatoes well roasted, are proper, but if they are in any degree waxy, they should not be allowed.

Fat bacon is a good article of diet, when the child will eat it. No brown sugar or molasses should enter into the diet. Weak brandy toddy is useful, likewise porteree made of good sound porter. Wine is rather disposed to produce acidity, and had better not be used.

To prevent cholera, the cold or tepid bath used every morning, clothing the child's body in flannel, rigid attention to diet, not allowing fruits or vegetables of an acescent character, with the use of bitter infusions every morning, and a little porteree at dinner, are the best prophylactic measures. If the child is at the breast, it should not be weaned in the summer, and if recently weaned, it should be kept on a milk diet, or return to the mother's milk.

These preventive means are calculated to preserve the tone of the digestive apparatus, sustain the functional activity of the skin, and uphold the equillbrium of the general circulation.

ART. VI.—*Remarkable case of the protrusion of a body, supposed to be the Pancreas, through a wound between the last true and first false rib.* By DANIEL C. CALDWELL, M. D. of Russellville, Kentucky.

In the autumn of 1816, two negro men, the property of Judge Bibb, then residing in this neighbourhood, having entered into a dispute, engaged in a severe conflict. While in a close scuffle, one of them stabbed the other in the left side, I

think, between the last true and first false rib, about the point of their greatest convexity. Through the wound, an oblong body, between three and four inches in length, was observed to be protruded.

My colleague, Dr. Boanerges Roberts, was called to visit him the next day. On examination, he was satisfied that the part was neither omentum nor mesentery, but did not feel positive as to its real character. However, he determined to return it immediately. In making the attempt, he found he could not readily accomplish his object, even after enlarging the wound and separating the ribs a little. He now began to entertain doubts whether the part, having been so long in a state of constriction, could be safely returned, and declined further proceedings until a consultation could be had. I was accordingly sent for; but being from home, on the arrival of the first messenger, did not reach the patient till the fourth day succeeding the injury.

At the first view, I thought it might possibly be a portion of the left lung; but on a more minute inspection, and examination with the fingers, that opinion was changed to the belief that it was the small extremity of the pancreas. In this opinion I was borne out by the concurrent convictions of Drs. Roberts and Heard.

We did not view the organ as indispensably necessary to life, nor did we calculate on the whole of its function being lost, as near half its length, and that of the large end, would be left. But whatever importance might have been attached to its function, the loss of all that portion exterior to the constriction was inevitable, being then in a gangrenous condition. The matter left for our decision was, whether it was better to trust to the spontaneous action of nature to throw it off, or to remove it by the ligature or the knife. Extirpation was preferred; and as it was apprehended that it was sufficiently adherent to the surrounding parts to prevent its being retracted into the cavity of the abdomen, so as to endanger the patient from bleeding internally, the bistoury was selected in preference to the ligature. Having removed the whole of the strangulated part, and finding our anticipations in regard to

the adhesions correct, and seeing no hæmorrhage to be dreaded, I brought the integuments into contact over the wound, and retained them in that situation by strips of adhesive plaister.

The patient soon recovered. He has suffered, since that period to the present time, now upwards of eleven years, no inconvenience, either from the loss of the part, or its unnatural adhesions, and now lives in this county, the property of Mr. Richard Bibb, jr. After the removal of the part, Drs. Roberts and Heard and myself, thinking it *almost impossible*, that the pancreas could escape through a part of the diaphragm and between the ribs, gave it a critical examination, which resulted in our thorough conviction of the fact. It might be that the patient, when the diaphragm was drawn upwards, in the act of *expiration*, its convex surface near the circumference naturally approximating the ribs at that moment, and being drawn forcibly towards his antagonist, received the stab in a peculiarly favorable position for accomplishing what happened. As the knife was large, and the connexions of the small extremity of this gland are known not to be very considerable, it is much less difficult to conceive how it could be detached from its natural position, than forced out of the trunk in the direction in which it escaped.

ART. VIII.—*Case of Polypus treated successfully with Tartar Emetic.*

Communicated by C. W. SHORT, M. D. &c.

Miss L. P. who had never enjoyed good health, but was delicate from a child, in her fifteenth year began to labour under the effects of deranged menstruation, attended with irregular appetite, costive bowels, disinclination to exercise, feelings

of lassitude and debility, a weak pulse, sallow complexion, and all the usual concomitants of marked chlorosis.

In this condition, efforts were made by the usual remedies, purgatives, tonics, the cold-bath, emmenagogues, &c. to bring about that change in her general health, and of the menstrual function in particular, which it was imagined would at once arrest the diseased phenomena of her case. This treatment, therefore, variously modified, was pursued for several months, but without any manifest amendment, and in the mean while a disposition to nasal hæmorrhage came on. This discharge was at first small in quantity, and recurred at irregular intervals; for the most part only after efforts at sneezing or blowing the nose had been made; it presently, however, assumed periods of more regular recurrence, as that of every two or three weeks, and came on without any assignable cause, whilst the quantity discharged was materially increased in amount.—It was consequently regarded as vicarious of the uterine evacuation, and the same treatment, with some increase of activity, was persisted in, not doubting but that the end aimed at, would be ultimately accomplished. About this time, after the nasal hæmorrhage had been repeated a dozen times or more, it became on one particular occasion so profuse as to excite alarm, and measures were taken to plug the nostril for its suppression. Whilst doing this, a tumour of the polypus appearance was discovered, from which the blood was plainly seen to discharge itself. Local styptics to the bleeding surface of this tumour, together with the liberal application of cold water to the head and neck, restrained the hæmorrhage for the time; but the patient's health continued to decline, and shortly after this, a bony tumour formed on the upper jaw-bone at the base of the zygoma: the eye of the same side became painful and weak, attended with slight inflammation and a constant flow of tears over the cheek. It was now obvious that the tumour of the nose proceeded from a polypus within the antrum of Highmore, which was already commencing the work of disorganization on its bony parietes, and that the disease was rapidly progressing to a fatal termination.

In this state of things, the removal of the tumour by an operation was advised, and for this purpose the patient was referred to the Professor of Surgery in our school. She readily assented to the proposition, and immediately undertook the journey to Lexington. On her arrival here, however, a distance of two hundred miles from her home, she was so much debilitated, and her general health was so bad, that Professor Dudley declined operating until her constitutional energies could be somewhat recruited; and to this end he advised her going into the country and pursuing a regimen which he directed. In this situation she soon fell under the notice of a neighbouring physician, who induced her to abandon the idea of submitting to an operation, and proposed to her a treatment somewhat different from any heretofore pursued by her. The prescription consisted in a weak watery solution of tartar emetic, taken several times aday, in such small portions as not sensibly to affect the stomach, whilst occasionally a few grains of rhubarb were interposed to obviate costiveness, and a light but nourishing diet was enjoined. She adopted the plan, and rigorously pursued it for six months, at the expiration of which time, there was a manifest amendment of her general health, and particularly of the local disease.

The bony tumour of the jaw had materially lessened, the polypus excrescence within the nose was barely discernible, the bleeding from it had entirely ceased, and the condition of her eye was much improved. A few moaths longer continuance of the plan produced, as far as could be discovered, an entire absorption of the tumour both osseous and fleshy, the diseased eye assumed its natural appearance, and her health was nearly re-established.

It has now been more than three years since the first occurrence of the case, and although the lady has returned to her ordinary mode of living, and has long laid aside her medicine, yet no indications of a return of the disease have presented themselves.

REVIEW.

ART. VIII.—"*Elements of Phrenology, by Charles Caldwell, M. D. Professor of the Institutes of Medicine and Clinical Practice in Transylvania University, &c.*" COMMUNICATED.

WHEN Dr. Gordon, in the Edinburgh Review, penned his animated and bitter philippic against the science of phrenology, he little thought that in less than fifteen years, extending itself throughout the borders of cultivated Europe, it would travel over to America, and penetrate even into its western forests. Little did he apprehend that, instead of making the speedy demise which he so confidently predicted, it was to become in this short space of time, lord of the literary ascendant—the master-science of the age. But such, beyond question, is now the case; for who does not know, that whether true or false, phrenology is every where the *fashionable science*—in every company, the theme of grave discussion or lively remark?

Phrenology was animated by a spirit different from what was conceived by its enemies. It rested on a foundation which they, in the blindness of their prejudice, could not perceive, upon the broad, imperishable basis of truth. It grew on a kindred stalk with astronomy and the inductive sciences, and was nourished and supported by the same careful observation. Time has shown these things to be so. Instead of passing to the grave of oblivion which had swallowed up the absurd doctrines of astrology and animal magnetism, to which it was compared, we see it in our day, "flourishing" in the vigour of its "youth"—"unhurt amid the war" of words which has been raised around it. Far from falling into neglect and contempt when the first gush of enthusiasm had subsided, it has grown and flourished with the rapidity of the young, tropical palm-tree, till now its branches wave over, and its fruit is scattered

over every quarter of the educated world. To prove that this is not the glowing language of enthusiasm, let facts be adduced, as they are abundantly at hand. About the commencement of the present century, the doctrine appeared a mere speck on the horizon of science, unwelcomed by philosophers and disregarded by the world. Dr. Gall, its promulgator, at first stood alone in its defence, sustaining for a time, unaided, the attacks of its enemies, his name itself being made the subject of pun and ridicule. Never did a doctrine seem to have fallen on more unpropitious times, never was the origin of one more unpromising, never was the dawn of any science more lurid and inauspicious. Ridicule, arising from every quarter, and of every kind, ran down upon it like a torrent. It was assailed on the score of its immoral tendency, as being favorable to materialism and deism, and even accused of legitimating crime. But things were soon to change. Gall was not long to sustain, alone, "the heat and burthen of the day." The plausibility of the scheme, the number of his facts, the force and ingenuity of his reasoning, soon won the confidence of his hearers, and drew to him fellow-labourers in the cause.

Spurzheim was destined soon to appear as a disciple of the science, and to become its Saul of Tarsus. Possessing a sprightly intellect, and great powers of generalization, with a temperament enthusiastic and sanguine, he was qualified by nature, for rendering it more essential service than his industrious prototype. Embracing it with great zeal, he began soon to write and deliver lectures in exposition of its principles. His labours have been extended to almost every considerable town of England and the continent, with the satisfactory result of making, in every place, converts to the cause. To him is due the praise of having contributed, by his numerous writings and prelections, more than any other individual, to the spread and popularity of the doctrine. Among many other distinguished converts made by his efforts, is Mr. Combe, of Edinburgh, another bright star in the constellation of phrenologists, a man whose learning and ingenuity would render him an ornament to any profession. He relates of himself, that he attended the lectures of Spurzheim, at first, merely that he might gather materials for the ex-

ercise of his humour; but finding in the manner of the lecturer, something so superior to the drivelling empiric, in the doctrine so much of the semblance of plain *common sense*, that he was won over to it, and having "gone to scoff," he literally "remained to pray." He has published an able work in exposition and defence of the science, and succeeded in establishing a *Phrenological Society* in his native city, in Edinburgh, the seat of sober habits, of caution and philosophy, the arena of metaphysics, the school and strong hold of the mental philosophy of Reid, Stewart and Brown; even in that ancient and well regulated city, where the citizens, in temperament, are cool and calculating and least disposed of any people to be pleased with innovation, or dazzled by novelty, the cradle of intellectual science, the garden in which the old school system of metaphysics has been most industriously cultivated and has struck the deepest root, even there has phrenology received the kindest welcome and excited the most lively interest. A journal is issued by this society, equal in spirit, in the amount of *amusing*, and, as phrenologists, we would say, *valuable*, *practical*, *important* matters, to any quarterly publication extant. Combe is its editor—its contributors are lawyers, physicians and divines, the first in learning, in talents and popularity in Edinburgh. In Paris too, in London, in Copenhagen, and many other considerable towns of England and the continent, societies are in existence, and active, lively operation, claiming for their heads and as zealous members, men of the first order of talents, and conducted in a spirit of philosophy and of truth, worthy of the science they are intended to foster.

Mr. Abernethy, the surgeon, distinguished alike for the philosophical acumen of his mind, his able investigation of the nature of diseases, his valuable contributions to medical literature, his manly opposition to the doctrine of *materialism*, and unbending moral integrity and firmness, has given his unqualified assent to the truth of phrenology. Sir Everard Home, too, the physician and philosopher, with Dr. Bostock, author of a late much applauded system of physiology, has become a convert and disciple to this science of mind. And to crown with triumph the march of the science in Europe, Doctor James John-

son, confessedly the first modern medical writer, and perhaps the most popular medical author of the age, has enlisted under its banners, pledging to it the aid of his genius and of his spirited and widely circulated journal.

It would be worse than superfluous to weary the patience of the readers of this review, by enumerating more examples of the triumphant progress of the science. Such a man as Abernethy is "ipse agmen," a shield against the puny attacks of its uninformed enemies–enemies who call names, and ridicule without having studied the doctrine an hour. Let such revilers of philosophy remember that the same weapons which are now wielding with such fancied adroitness, were in the hands of those who opposed the discoveries of Harvey, Newton and Gallileo. Let wits and essayists, in newspapers and magazines of literature, continue to display their talent of ridicule at its expense, phrenology is satisfied while it is making such acquisitions as the "Medico—Chirurgical Review" of London; and when it finds on this side the waters, such advocates as the learned and ingenious author of the "Elements."

Such has been the progress of the science in Europe; and although in the United States it has been less like "a Roman triumph, exhibiting power and riches at every step, and glittering all over with the spoils of the whole ransacked world;" still it has been equable and onward—equal to the importance of the science, and worthy of our character of devotedness to philosophy. The production of the volume under review, shews that we have not been blind to the beauties and the value of the science; its extended circulation, and the avidity with which it is sought after, are evidence of the excitement of the public mind on the subject; and the encomiums which have been bestowed upon the work abroad, are proof that we have not laboured wholly in vain.

The following are a few complimentary remarks, extracted from the "Phrenological Journal," occasioned by the appearance of the "Elements." We cannot forbear to introduce them, though out of place here, because it affords us pleasure as Phrenologists and Americans, to spread abroad the fame of a distinguished countryman and friend. Combe is the author

of the remarks, and they are the more to be prized because he is a foreigner and a member of a different profession. "We therefore, hail the appearance of this little work, (Elements of Phrenology,) with sincere pleasure, as well because it is the fruit of knowledge, and profound investigation, as because it is the first original publication on Phrenology by an American author."

In this work, Dr. Caldwell displays the *force, clearness, comprehensiveness and depth of mind, which at once characterize the philosopher.* The accession of such men is one of the surest indications of the triumph of the cause. In him, there is combined a capacity of thinking and reasoning obvious to every one, a regular medical education, and a practical acquaintance with phrenology. Let then, the opponents ponder the result. The favourable testimony of one person so qualified to judge, outweighs the hostile denunciations of thousands, who, to the simple interrogatory, "have you studied the subject?" are obliged to reply in the humiliating negative, "no."

These "Elements" were published at the request of the author's class, who had heard him in the winter of 1823—4, unfolding the principles and expatiating on the beauties of the science in a series of lectures, which we think have been seldom equalled, in all that is eloquent, forcible and impressive. He declares that the work is not intended to embrace all the interesting details of the science, but rather as a *horn-book* for beginners, and as a hint calculated to excite inquiry. In the narrow compass of one hundred pages, it is not reasonable to expect the matter of large volumes. Much of the reasoning and many of the facts which belong to it as matter of illustration, have been necessarily omitted; but, it is still a work *complete* in itself—capable, perhaps, of affording a better view of the *tout ensemble* of the science, than any work on the subject. Brief as it is, and "with all its imperfections on its head;" for it has its imperfections, (and what book has not?) we have always considered it the *chef d'œuvre* of Professor Caldwell's works—the most felicitous of his labours—executed like the Rasselas of Dr. Johnson, in one of his moments most propitious to intellectual effort, when his mind was prepared for exertion,

and all his faculties were in full play. In style, it is manly, ornate, and racy; in matter, opulent and original; in arrangement, simple and perspicuous.

But notwithstanding we feel disposed to bestow upon this little work, such exalted praise, we have, still, fault to find with it. It is too much a *manual*—a mere *outline* or *syllabus* of the science, suited only to the situation of learners. The author has confined himself within limits that are too contracted. He has not allowed himself sufficient elbow-room—has not introduced a sufficient number of the facts which support the system. But the greatest deficiency consists in not having shown the application of the science to the various walks and purposes of life. After having waded with much labour, through a severe analysis, and compassed, in our mind, the principles of a science, it is natural to inquire, "cui bono?" In what calling will the light of this system illuminate our way? What profession will it enable us to pursue with more honour to ourselves, or advantage to our country? In what way will it meliorate the condition of society, and add to the sum of human happiness? These are questions which the ever restless mind, in its pursuit after truth, is wont to make. And it will not be satisfied without an answer. "We ought not to demand, *what is this good for?* the usefulness of every thing will be known in its due time," is the opinion, long since expressed, of Jesus the son of Sirach; but we find great difficulty in persuading ourselves to believe it. Nor are we ready to assent to the proposition of Bonnet, that "reason does not know any dangerous or *useless* truth;" but like to see the utility of every scheme fully laid open, before we enter into it.

It belongs to a second edition to remedy these imperfections; which edition, we understand, is in a state of preparation to be published ere long. In it the author purposes embracing the utilities of the science, its importance in education, in medicine, in politics, in legislation, and in law. It will also, we understand, contain something on the philosophy of criticism, and an explanation, upon phrenological principles, of the diversity and peculiarities of national character. A system of philosophy, capable of shedding light upon subjects of such

paramount importance, must be considered as having strong claims upon our consideration., Indeed, when contemplated as covering this wide, varied, and interesting range, phrenology is not only the most *delightful* of sciences, but towers into real magnificence.

Professor Caldwell's mind being well adapted to the investigation of such subjects, we expect with great pleasure, the appearace of his work. We shall be greatly disappointed if he does not produce something worthy of the subjects and of himself.

Appearing with such additions and improvements, under the favourable auspices of the present period, when the spirit of inquiry is abroad, and phrenology is, every where, exciting such interest, we are disposed to augur favourably of the success of the forthcoming edition. The first impression is now out of print. It was never offered publicly for sale, nor was it *published* in the sense of the booksellers. But notwithstanding this, the short period since it appeared, has been sufficient to swallow it up. Not a copy of it can now be had; while a demand for it has continued to increase, in proportion as it has become more extensively known.

The prefatory note is taken up with the consideration of the relative importance of mind and matter. On this subject, he is more diffuse, we think, than its importance required. All that can be said on it, amounts to little more than this—that, in the present condition of human things, matter and spirit are equally important in all the operations of life; that constituted as man is, his thoughts, his passions and emotions, are as dependent upon the *corporeal*, as upon the spiritual part of his nature.

"Man, like the universe itself, is composed of two created substances, matter and spirit. To make him what he is, these two substances are equally essential. Remove either of them, he is man no longer. Take away his spirit, he is reduced to a mass, incapable alike, of perception, volition or reason. Take away his material portion, and we know not what he is—a spirit still—"the ghost of what he was," but under what form or mode of existence and action, we are perfectly ignorant.

"Whether, when the spirit is separated from the body, it remains, *for a time*, a *disembodied* spirit, or is united immediately to another organized and *material fabric*, is a question respecting which the most pious and enlightened individuals differ in opinion." p. 5th. Before these matters, God, in his wisdom, having been pleased to drop the curtain, it is most proper for us, as beings of limited views, to content ourselves in our ignorance, rather than attempt to penetrate beyond it, and lose ourselves in vague hypothesis and interminable error.

Seeing, as in our present condition we do, "through glasses darkly," we must not hope to arrive at a knowledge of things placed beyond the grave, which are not given to us in Revelation; what is to be the condition of our system in another state of existence; what the character of our being there, are matters about which we may speculate forever, without a likelihood of arriving at the truth. For ourselves, we prefer resigning all such subjects to the dealers in transcendentalism, and engaging in things of greater certitude. Mind, in another state, may, or may not be associated with material frame in its operations. God is omnipotent, and can endow it with new faculties and powers, if it please him. Sufficient is it for phrenology, that in this world, they are united, and act and re-act upon each other, in ceaseless reciprocity.

The author divides the science into "phrenology *proper*, and craniology."

"The first treats of the connexion and reciprocal influence of the mind and brain."

"The second, of the quantity and figure of the brain, as manifested by the size and figure of the cranium."

"By a knowledge of both, the experienced phrenologist is enabled to judge of the natural amount and general character of the intellects of individuals, from the inspection of their heads." Under the head of "Fundamental Propositions," he lays down what may be considered the phrenologist's *confession of faith;* the strong points of the doctrine; the positions upon which the science rests and is supported. The sum of all of which is, that man consists of soul and body; that though mind and matter may exist and act *independently* of each other,

neither the mind of man, nor the matter which composes his body, can *thus* act *intellectually;* that, *in his present condition*, the co-operation of both is essential in every intellectual process; that the brain is the organ of the intellect; that it is not a *simple*, but a *compound* or multiplex organ; that each original propensity, sentiment, or intellectual faculty, has a specific cerebral organ; and that the situation and functions of many of these being known, when strongly developed, they are matter of observation.

Phrenology hazards no opinion respecting the condition of the mind when separated from the body; nor does it attempt an exposition of the *manner* in which, when connected, mind and matter influence each other. The fact that they are united, and the phenomena produced by this union, constitute the legitimate objects of the science. Every thing beyond this, is transcendental and foreign from the nature of phrenology.

The first section is nothing more than a continuation of the views advanced in the prefatory note. The author descants with great animation on the beauty, grandeur and magnificence of the material world. To demonstrate its importance, "let us fancy," he remarks, "its instant and entire extinction. In such an event, where would be the beauty, the harmony, I had almost said the utility of the universe? Where indeed would be the universe itself, or what would be its character? Instead of that magnificent pageant of peopled suns and systems, rolling through space, and exhibiting a scene of sublimity and grandeur, worthy of the conceptions and exertions of a God, *existence*, could we so name it, *creation*, could the term be used, would be a lightless, noiseless, tenantless, void."

In the second section, is contained, what we have always considered one of the strongest positions that can be taken in defence of the science, and embraces probably, the most original and valuable of the author's contributions to it. *Original* the views unquestionably are; for in the works of Spurzheim, Combe, &c. instead of the unity of the mind being assumed, and made a position of defence, no provision is made for it, but on the contrary, as they contend for an inherent plurality of faculties, it is by *implication* if not *positively* denied.

That mind is a unit, is a truth important to phrenology, and one which the believers in the soul's immortality, would not give up for the universe. It is a truth upon which the immateriality of the soul depends for support; without which, all our fancied bliss, our anticipated enjoyment in another state of existence must fall to the ground, "and like the baseless fabric of a vision, leave not a wreck behind."

Seizing upon the position which all are willing alike to concede, as well the philanthropist as the christian, the metaphysician as the phrenologist, our author has made out one of the strongest points in support of the doctrine. That the mind as a *unit*, is not capable of so co-operating with the brain as a simple organ, as to produce the great variety of faculties with which our nature is possessed, is a novel idea, and we think one of peculiar felicity. Were it not so, then indeed in the words of the author, "would the thing contained be greater than the thing containing it, the effect superior to the cause, the endowment superior to the thing endowed."

We consider the reasoning of Professor Caldwell on this subject, not only perspicuous and forcible, but truly irresistible.

The reasoning of the author in the third section, to prove that the brain is the organ of the intellect, is concise, lucid and satisfactory. That such is the fact, a host of circumstances are cited to prove; among which the following are a few. Injuries of great extent, involving every other organ of the body but the brain, are sustained without affecting the mind, and *vice versa*, *accphalic monsters* shew that the brain is not essential to mere *animal* life; a malformation or deficiency of brain is always accompanied by a corresponding want of intellect; in ascending from the lower to the higher order of animals, the number of intellectual faculties increases in proportion to the complexity of the brain.

The author proceeds in the fourth section to offer a reply to the various objections which have been urged against the brain being the organ of the intellect. When the futility and utter feebleness of the objections are considered, it is not paying him a high compliment to say, that his reply is perfectly triumphant. A serious reply is certainly not demanded to such absurd objec-

tions, as that the brain is occasionally "*ossified* and even *petrified*, the mind remaining vigorous and uninjured."

The author next proceeds to show that the brain is not a simple, but a compound or multiplex organ. Unless this part of the subject be established, all that has preceded amounts to nothing—to nothing but what has been currently believed in all ages of the world, merely that the brain is the organ of the mind. But that such is the character of the brain, is not only a matter of observation, but has been demonstrated. Gall and Spurzheim have been able to show with their dissecting knives, that the brain is really a *congeries of organs*. This is the most substantial kind of reasoning, to be met only by observation and experiment. Analogy is fruitful in facts corroborative of observation. One which, so far as we are acquainted, phrenologists have never mentioned, is furnished by the nervous system. In the interesting experiments lately made on this subject by Bell, Magendie, &c., it has been discovered that nerves, taking their origin in the brain and spinal marrow in a state of the greatest propinquity to each other, and running to be distributed upon the same parts, yet bestow upon them very different susceptibilities and functions. Of this, an example occurs in the portio dura, and the trigeminus, nerves belonging to the face, rising contiguous to each other in the brain, distributing themselves upon the muscles, integuments, &c. of the face; the former endowing them with *motion* and *expression*, while the latter is the source of their *sensation*. Or perhaps a more striking example is furnished by the apparent branches of the trigeminus. It is known that the different threads of this nerve bestow the sense of feeling upon the face, the sense of taste upon the tongue, and the power, whatever it is, by which the salivary glands are enabled to perform their functions. And yet, different as are the properties conferred by these different nerves upon the different parts of the body, in origin they are the same, and the same in every thing that relates to anatomical structure and external appearance.

The sixth section contains nothing of originality, the author aiming only to present a brief and perspicuous view of the situation and functions of the organs, as laid down in works on

phrenology. When published, the "Elements" were not accompanied by a *plate* or *map* of the brain, by which alone can a correct knowledge of the locality of the organs be obtained. One was afterwards struck, but was never incorporated with the work. This is a part of the subject which would admit advantageously of considerable amplification, being, as it is, the basis and very ground work of the science; for unless it be true that these cranial protuberances are accompanied by correspondent features of character, as by observation they are said to have heen proved to be, then phrenology, with all its beauty and symmetry of theory, must fall inevitably to the ground. In the edition about to be published, is is hoped the learned author will be more copious on this department, and will favor the public with the fruits of his own observations; as observations varied and valuable, amid his travels he must have made. One passage of this section, we cannot forbear to introduce here, on account of its beauties of expression. It is what he says on the organ of "ideality." "Its function is to give exquisiteness to feeling, sentiment and conception to all the exercises of the other faculties. It is the organ of poetry, giving to every object and every prospect, superadded charms and ideal perfections. It may be called the organ of inspiration. Into the prose compositions and even the conversation of those who possess it in full developement, it infuses the sentimental glow, the picturesque delineation and all the elastic spirit of poetry. Under the full influence of it, Shakespeare wrote the following lines:

> "The fair Publicola, the moon of Rome;
> "Chaste as the icicle that's curdled by the frost
> "From purest snow, and hangs on Dian's Temple."

"This organ is the foundation of enthusiasm, the real Helicon, not merely of the poet, but of the philosopher, the orator, the painter, the sculptor, the mechanician, the philanthropist and even the generous and highminded warrior."

The author proceeds in the seventh section, to repel the calumnies which have been heaped upon the science. His refutation of them is complete. It is impossible that they can ever again be urged, except in a spirit of the most bigoted opposition.

Let all who believe that phrenology is a science fraught with any sort of danger, read this section and be corrected of their error.

The eighth and concluding section, is made up of miscellaneous matter. It embraces a notice of a work by Professor Warren of Boston, in which the doctrine of phrenology is impugned. Whatever comes from the pen of so distinguished a man as professor Warren, is worthy of notice; but in this instance, we think he has fallen into error. The remarks of Professor Caldwell in this section, show that his work is not calculated to do the science serious injury.

The author concludes his pamphlet by a quotation from the physiological works of Mr. Abernethy, showing that this able medical philosopher is a firm believer in the truth and value of the science.

These "Elements" have been, now, some time before the public, and have excited a full share of attention. They have been commended at home and abroad—in journals professional and unprofessional—by physicians, lawyers and divines. They have gone through one edition, and the second is now in preparation. We shall hail its appearance with pleasure, because we think it is calculated to do good. L. P. Y.

Since writing the Review of the Elements of Phrenology by Professor Caldwell, we have had the gratification to receive a copy of the second edition, enriched with copious additions on the utilities of the science. As we esteem this more interesting than any other part of the work, it is our intention to offer a review of the improved edition, for the second number of the Transylvania Journal. L. P. Y.

Art. IX.—*Biographical notice of* Wilson Yandell, M. D. *late of Murfreesborough, Tennessee.*

In this new country of ours, where but half a century since red men and wild beasts were the sole tenants of the soil, few of our physicians have attained great celebrity. Toiling during their day with assiduity and usefulness in their vocation, but with few facilities at hand for communicating their knowledge, they have toiled in obscurity; and their works, their experience, and their discoveries have gone with them to the grave. All that they observed that was new and peculiar in the diseases of this unexplored country—all the valuable facts which they collected in the course of a long professional life have been confined to themselves, and are now lost to the world.

Such has been the fate of our professional forefathers, who beheld the dawnings of science and civilization in the West, and having spent their lives in a new and untilled field, have now fallen asleep. But a happier destiny awaits us, their sons. They removed the obstacles which lay in the road to professional distinction, and prepared paths comparatively smooth for our feet—in the march of improvement new lights, on every hand, have been kindled up in our woods—the periodical press has opened to us its channels—*philosophical*, as well as *practical* eminence is now within our reach.

Nor are incentives wanting to prompt us to action. The worthy example of our industrious progenitors is before us, emulation is awakened by the enterprise of our cotemporaries in the East, suffering humanity invokes us to unite in the work of widening the borders of science and circumscribing the ravages of disease, and fame and emolument rise up to our view in cheering prospective.

These thoughts have risen in our minds, while reflecting on the character and fortunes of one of the early practitioners of

this country, who has recently terminated his earthly career. One by one these veterans of the healing art are falling victims, themselves at last, to our common enemy, and ere many seasons shall have passed away, they must all have gone to the world whither we are all hastening.

We should hallow their memories when they are gone, and in gratitude, record their virtues and their deeds of usefulness. For if there be a class of men entitled above the rest to the veneration of mankind, it is those who have dedicated their lives to meliorating the condition of humanity, without expecting an adequate reward. To this class belonged, emphatically, the subject of the present notice. Few men have deserved more of those who lived within the sphere of their influence—few ever spent more days of useful, benevolent, disinterested labour.

Born to no inheritance but a good mind, Yandell was the architect of his own fortune. He was the fourth son of William Yandell, and was born in Mecklenburg county, N. C. on the 17th of December, 1774. His father was an indigent, but pious and reputable farmer. He was under the command of General Braddock at his memorable defeat; and he served his country faithfully as a soldier through the whole period of the revolutionary struggle. He was an honest man, a valiant soldier, and an exemplary christian. He trained up his offspring in habits of virtue and industry, and had the satisfaction during his lifetime, of witnessing in their success, the beneficial effects of his parental care.

His mother was a woman of fine understanding, retentive memory, and considerable literary taste. It was to her that he was indebted for the ardour that was manifested in his youthful character, as well as for the energy and acumen of intellect which distinguished him in subsequent life.

He evinced at a very early age more than ordinary thirst for knowledge. Before he was capable of reading, or even knew a letter of the alphabet, merely from hearing the sabbath recitations of his older brothers, he had memorised, and was able to recite, a greater portion of the shorter catechism. He had attained his eighth year before he was sent to school, but

his industry and zeal made him soon a proficient in his primary studies. It is related of him by an older brother, now living, that he often left home without his breakfast, when it was not ready in time, from a desire to be in place at the usual hour. As he advanced in years, his thirst for information became confirmed, and he availed himself, with eagerness, of every mean within his reach, for gratifying it—devoting every moment which was spared him from his labours in the farm, to profitable reading, and courting the society of those who were capable of instructing him. His youth was an epitome of his mature age, exhibiting the same love of truth and rectitude, the same practical turn, the same devotion to business, the same intellectual acumen and thirst for knowledge.

He was designed by his father to pursue his own occupation; but losing his health, in consequence of wading imprudently in cold water when overheated at play, it became necessary for him to seek an employment requiring less vigour of body. Accordingly, in his nineteenth year he engaged in teaching a country school, and set about, at the same time, qualifying himself for a profession. In this calling he continued to labour three years, the intervals of leisure which occurred between his duties being devoted to the study of the physical sciences.

He left his father's house in the 22d year of his age, with but his clothes, his horse, and ten dollars in money. With this slender patrimony he directed his course to the Western wilderness, in hope, like other emigrants, of finding beyond the blue hills, a home and a fortune more congenial with his taste. It has been remarked truly, that "genius has often a divinity within itself; a sort of prophetic consciousness; a daring insight into futurity; an irrepressible impulse which animates and supports it in the midst of discouragement and neglect."

It was so with young Yandell when he left the homestead of his parents. The aspirations of his active, ardent mind, looked to a situation of more splendour than what seemed to be promised him by his humble fortune. And under his poverty and the circumstances of discouragement which attended his early career—in the absence of every thing to cheer him in his course, save only the success of kindred spirits under kind-

ted circumstances of adversity, his resolution never forsook him.

Upon reaching Tennessee he disposed of his horse for money, and applied himself with all the energies of his soul to the branches of learning preparatory to the study of a profession. When his capital was exhausted, he resorted to school-teaching to procure more funds; and thus devoting himself alternately to his own studies, and the instruction of others, as his situation required, he travelled at length through the usual routine of collegiate studies.

Having terminated his academical course, he entered, without loss of time, upon the study of the *law*. This he prosecuted, with proficiency and promise for six months; but discouraged by the inconsiderable demand which, in the then infant state of society, existed for legal talents, he at length abandoned it for *medicine*.

He embarked in the study of his new profession under the guidance of Dr. William Holt, at that time an eminent physician of East Tennessee.

Removing shortly afterwards to the western end of the state, he continued his studies with Dr. Hamilton, who was pursuing his profession with considerable reputation in Sumner county. With him he terminated his pupilage in the science of medicine; for, pressed upon as he was by the unrelenting hand of poverty, he had it not in his power to draw from that rich source of instruction afforded by medical lectures.

In association with his preceptor, he entered upon the high responsibilities of his profession; and he had begun to realize the prospects of felicity with which his fancy had beguiled the tedious hours of his pupilage, when it was his misfortune to lose his partner. By this circumstance he was deprived of an experienced and valuable friend—of his kind Mentor; and left to work his way through the world as he could. Applying the language of the bard to his *professional* situation—with no predecessor's steps to tread in—no path of safety before him by experience marked out, it may indeed be said,

"No father's guardian hand his youth maintain'd,
"Called forth his virtues, or his vice restrain'd."

Yandell entered upon the practice of medicine with but a limited library. By his diligence, however, he made amends for this. He studied with the greatest care the few books in his possession; among which were the works of Sydenham, Cullen, and Rush. These were always favorite names with him. Rush was his *great* authority. Him he considered the *father of American medicine;* and with the admirable system of professional morality to be found in his writings, he was as familiar as with the doctrines of his bible. His practical precepts were always in his mouth, particularly the admonition "*to prescribe for the symptoms, and not the name of the disease.*" Shortly after the death of his partner, he removed to Dixon's Spring, Smith county, where he got, at once, into an extensive practice, and formed some of the most interesting attachments of his life. It was during his residence here that, finding himself in possession of the means for rendering him easy and independent in life, he determined on changing his state. He was married on the 17th of May 1804, to Elizabeth Pitts of his neighbourhood, the daughter of Lunsford Pitts, a native of Virginia, and a gentleman of wealth and standing. In the enjoyment of as much connubial felicity as falls ordinarily to the lot of humanity, he continued to live with this amiable lady, now left in dreary widowhood, to the day of his death.

A short time after his marriage he again changed his residence, settling himself on Goose creek, in Sumner county. Here he continued to reside many years in the exercise of the talents with which nature had richly endowed him, amassing wealth and fame, and dispensing favours to his fellow men with a hand that bespoke the benevolence of his heart. During his residence here, the disease called *milk sickness* came under his observation; and he was probably the first medical man in the West to observe, or treat with success, this singular malady. From having lived many years amid the complaint, with cases in every stage always under his care, he was better qualified than any physician of our acquaintance, to write practically on the subject. But this he never found time to do. He entrusted the task to those whom fortune had favoured more in their youth, and whose time was less engrossed by a multiplicity of cares.

On the exercises of his heart about this period, when fairly setting out upon the voyage of life, with a partner to share with him its good or evil fortune, and with the prospect of an offspring to be affected by his example, we have often heard him speak. For some years he had been striving to be an infidel; he had read the writings of Volney and Paine, and they had poisoned his mind. For a season he doubted; but he made now a solemn pause: he weighed impartially the arguments in favour of religion; happily, light from Heaven broke in upon his mind, and he experienced that change which the highest authority pronounces essential to the enjoyment of bliss in another state of existence. From this time to the close of his life, he continued to be an exemplary member of the Methodist Episcopal Church.

In the year 1816, he removed to Rutherford county, in the vicinity of Murfreesborough, where he spent the residue of his days. In the spring of that year, he was attacked by an afflicting distemper, which doomed him to a life of decrepitude. He had experienced for many years symptoms of a diseased *prostate gland*, and after unusual fatigue induced by professional labour, he suffered an aggravated attack of the complaint. For several weeks he almost despaired of recovery; but the disease mitigated in time, and he was enabled to return to his business. This was not the shaft destined to put an end to his valuable labours. Days of eminent felicity and usefulness were appointed to him yet; scenes of gladdening hue lay yet before him, which were to "make him love to live." In the growth of his reputation, and in the prosperity of his domestic concerns, he found cause for felicitation, and for gratitude to Heaven. His reputation for professional skill had by this time become very high, and his practice was engrossing, not being confined to his own county, nor even district of country. He was often consulted in cases of difficulty, by persons residing in other counties, and not unfrequently by invalids of other states.

In the spring of 1822, the honorary degree of Doctor of Medicine was conferred on him by the University of Maryland—an honour which he never sought, but which must have awaken-

ed in him feelings of lively pleasure. He was elected in the winter of 1825, honorary member of the Lexington Medical Society.

As years accumulated upon him, his professional labours were more in requisition; and animated by too ardent a desire to relieve the sufferings of his fellow-creatures, and advance the interests of his family, he was heedless of the circumstances of caution rendered necessary by his time of life. Every day he endured fatigues which were badly adapted to the infirmities of age. But at no period of his life did he suffer his own personal ease and safety to be put in competition with the good of his fellow men, and his energy was unabated to the close of his career. But his constitution sunk under such severe trials. In the winter of 1827, he suffered an injury by the falling of his horse, which terminated in fever, and from which he never perfectly recovered. His constitution reacted but imperfectly, and he continued subject to repeated attacks of slight indisposition till the 17th of September, when he was overtaken by the autumnal bilious fever. Urged by the calls of professional business, he did not attend to his complaint for several days, but continued without relaxation till the 21st, to visit the sick. At this time, his disease became so violent that he was compelled, greatly in opposition to his wishes, to take his bed. He never rose from it again. The disease had struck its roots too deep ere he had attempted to counteract it. From the commencement of his illness he expressed serious forebodings of the issue. He said he thought he should not recover. He had expressed fears to his family, months before, that his *fifty-fourth* would be a difficult year with him, if it did not close his life.

"Thoughts are prophets still;
"The soul all hostile advents sees,
"Like shadows in a brilliant day
"Cast down by falcons on their prey."

His malady mocked the efforts of his own skill, and the united efforts of the faculty of his neighbourhood. It advanced with rapid strides, and he predicted on *Wednesday*, the fourth day of his illness, that his sufferings would end on the approaching Sabbath. His prognostications erred but one day—on

Monday, the first of October, in the 54th year of his age, he closed his eyes upon the world forever.

Thus has perished in the prime of philosophical life, in the zenith of his fame, and in the midst of his usefulness, a man who will be long remembered and revered by his countrymen for his peculiar virtues and his eminent services. The event, creating as it did, a vacuum in society so wide and deplorable, awakened among all classes a deeper and more diffusive sympathy, than was ever before called forth in this region of country, by any similar bereavement.

During his laborious life, Yandell never published any thing connected with medicine; and posterity will find nothing to justify the high opinion which his cotemporaries entertained of his talents. All who have heard him converse, bear testimony to the elevation of his genius, and to the richness, extent, and variety of his resources. His unbroken silence grew out of the circumstances connected with his early education and career. Writing, like every thing else, is a habit, and he who in his youth, has not disciplined his mind by a course of patient and laborious practice, will find composition in after life, an irksome task. Launched at once upon the ocean of business, Yandell found no leisure in the early part of his career to employ his pen, and the all-engrossing cares which pressed upon him towards its close, were still less propitious to this employment. In this, the science of medicine and his country have not suffered less than his own reputation. The experience of a man so richly endowed, on a subject so interesting as the diseases of a new country, and of a peculiar climate and population, all will acknowledge, would have constituted a valuable accession to the treasure of medical facts. But all this rare, useful knowledge, not lodged in the minds of his pupils, has gone with him to the grave.

As a physician, Yandell was among the most eminent in the part of the country in which he lived; and in point of *practical skill* he would have ranked among the first of any country or any age. Besides talents of a high order, he united in his character the greatest industry and punctuality in the discharge of his duties, manners pleasing to all, and that never failed

to conciliate the sick, patience in listening to the unhappy sufferers tedious detail of symptoms, a thorough knowledge of his profession; and when we add to these, the virtues of a christian, expansive, genuine philanthropy, and humanity to the poor, we have a rare assemblage of qualities, which account at once for his uncommon popularity. In every department of his profession, with the single exception of *operative surgery*, for which he had no taste, he was eminently skilful; but it was in the more difficult and more delicate branch of chronic diseases, and the complaints of females, that he exhibited his most consummate skill. Here he was confessedly pre-eminent.

He held his profession in a correct estimation, and he laboured to preserve it in its purity. His port and demeanour, his intercourse with the world, and particularly the highmindedness which he manifested in *professional* intercourse, his variety and extent of acquirement, the principles of honour and morality which he cherished and maintained, were calculated to reflect on it additional lustre. He detested empiricism, and did all that was in his power to discountenance it. Of all the physicians of our acquaintance, he was the warmest advocate for the general diffusion of medical knowledge among all ranks of society; for in this, he believed was to be found the surest antidote to quackery. He was for having no secrets, the very semblance of empiricism, its mystery and its mummery, he despised and discouraged. One thing was peculiar and apparently inconsistent in his conduct—he never refused to consult with a quack. But it was with the hope of rescuing the patient from the hands of ignorance, and of evincing the superiority of science and skill that he did so; "for if I do not meet him," he was wont to say, "he will retain the patient, as he enjoys his confidence, and humanity will suffer; but in our consultation and intercourse, the difference between the physician and the pretender will appear."

He was a well informed man on every subject, and knowledge in his hands always assumed a useful shape. Montaigne said "he had rather be a good horseman than a good logician." This was the notion of Yandell. He was no recluse or pedant in his learning, but a practical philosopher, whose first high

aim in every thing, was to increase the sum of human enjoyment.

No man, we confidently believe, ever performed more gratuitous practice, or performed it with greater alacrity. A divine,* eminent alike for his good sense and his piety, who had for many years been familiar with his private walk, has been heard to say that, "he believed Dr. Yandell was more studious of *doing good to his fellow creatures* than of *promoting his own private interest.*"

If we have ever known a real philanthropist, a man who in all the actions of his life, excluded all feelings of selfishness, whose unvarying principle of conduct was benevolence, disinterested, expansive, who sought in all he did, "to sweeten all the toils of human life," it was Yandell. During the twenty-five years which he devoted to his profession, there were families who looked regularly to him for aid in their sickness without expecting ever to reward him for his services. Clergymen experiencing the *res angusta domi*—indigent widows and unmarried females, dependent for support upon their own industry, never failed to receive from him the helping hand of charity in time of their distress. And this he did with so good an air, that the sufferer was never made to feel his dependance. Without reluctance it was done, and as if a part of his regular business. He was commonly called, and not with greater emphasis than truth, *the poor man's physician.*

That these things are so, that the writer is indulging in no extravagant panegyric, the public grief which was expressed on the occasion of his demise, the gloom which diffused itself over the countenances of those who know the need of charity, abundantly testify.

He was an ardent patriot. He loved his country with a pure zeal, and felt a lively concern in the administration of its affairs. He loved it because it was free—because, under its laws, every man is as he ought to be, *free* and *equal*—because it is a government of opinion, and guarantees to all the liberty of speech. In his political principles he was catholic. He em-

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*The Rev. Ebenezer Megowan, of Rutherford county, Tennessee.

braced, in his policy and affection, his country, his whole country and nothing but his country. Sectarianism never entered into his feelings. In the expression of his opinions, touching men and measures, he was frank and fearless. He professed allegiance to no man; by no one could he be intimidated; "he feared God, and God alone."

He did not render his country more essential service in the walk of his profession, than by engaging with zeal in its public and national concerns. By nature as well as by education, he was perfectly adapted to the infant state of the society in which he was placed, his activity and enterprize, the versality of his genius, and the variety of his resources, qualifying him in a peculiar manner, for maturing its institutions and hastening the march of cultivation.

He was truly the soul of the society in which he lived, always foremost in every enterprise, always looked up to for counsel and instruction. His neighbours as uniformly applied to him for advice in cases of *law*, as in matters which related to his own profession. And by his integrity and firmness, by the frankness of his manners and the obligingness of his temper, by entering with warmth into their affairs, their feelings, their wishes, by the display of high mental powers, ever subsidiary to the cause of justice, he won over them the most unbounded influence.

With a mind so richly gifted as was that of Yandell, and with feelings so aspiring, he would have attained to the head of society in any place. And it is a circumstance which his friends may well regret, that his destiny did not place him upon a theatre more favourable to the display of his abilities; that his sojourning was not in a land where science had erected her temples and formed her associations, and where his virtues and his deeds would have found when he was gone, like Rush, and Wistar, and Barton, an eloquent panegyrist.

As a companion his qualities were of the highest order of excellence. His mind was always busy, and his tongue was rarely still. In his family, on the way side, in the chambers of the sick, in his minglings in society, he was ever discoursing on topics of interest and profit to his companions. It was remarked

of him by a gentleman who had observed him during twenty years, that he never visited a house without doing it good—without dropping some practical hint, or leaving some counsel, calculated to improve its condition. On things pertaining to religion, as well as on subjects connected with our present estate, he was qualified, and ever ready to converse. The good which he did to the cause of holiness, and to the souls of his fellow men, it would be hard to estimate. He never left his patients in the time of their convalescence—when the heart is intenerated by suffering—that hour so auspicious to religious impressions, without impressing upon them the truth of religion, and the necessity of preparing in health for the end appointed to all.

He was blessed with a felicitous temperament. Nature had given him strong feelings, but he had tempered them aright, and they were ever engaged on the side of humanity, truth, justice. The peaceful sunshine of his mind was rarely disturbed; his moral skies were seldom overcast by the gloom of melancholy. He knew not what it was to be unduly elated by emotions of gladness, or sunk into despondency by forbidding prospects. Ever equable, serene, cheerful, his society was a treat and a medicine to those who needed consolation. In casting his temper in so happy a mould, nature designed him to be a physician of the mind's maladies.—

"To pluck from the heart its rooted sorrow,
"Raze out the written troubles of the brain,
"And with a sweet oblivious antidote,
"Cleanse the foul bosom of the perilous stuff,
"That weighs upon the heart."

In this harmonious regulation of his mind, religion had its share. He experienced in that deep, exhaustless fount, a cure for all the ills that beset humanity in its present condition. With the eye of faith he saw, that though his "earthly house of this tabernacle were dissolved, he had a building of God, a house not made with hands eternal in the heavens." No one ever felt more of the consolations of religion, for no one ever lived more perfectly up to its precepts. He was a christian of *works*. And if a truly benevolent and charitable heart, communing statedly with itself and its God, a hand ever ready to

relieve the distresses of his kind, a temper prone to acts of generosity and forgiving of injuries, unremitted efforts to meliorate the condition of humanity, and a strict conformity to all the ordinances of religion, constitute the essence of true christianity, he was a christian indeed.

ART. X.—*Meteorological Journal, for January* 1828, *by* THOMAS J. MATHEWS, A. M. *Morrison Professor of Mathematics and Natural Philosophy in Transylvania University.*

Date	*Hour*	*Ther.*	*Barom.*	*Wind*	*Weather.*
6	7 a m	64	28,916	S. W.	Cloudy.
	1 p m	70	28,844	S. W.	Cloudy.
	7 p m	66	28,820	S. W.	do. blustering.
7	7 a m	63	28,840	S. W.	Rain.
	1 p m	56	28,912	S. W.	Cloudy.
	7 p m	49	29,015	S. W.	Cloudy.
8	7 a m	47	29,074	N. W.	Rain.
	1 p m	43	29,130	N. W.	Cloudy.
	7 p m	42	29,226	Calm.	Cloudy.
9	7 a m	39	29,148	East.	Cloudy.
	1 p m	40	29,053	Calm.	Cloudy.
	7 p m	42	29,020	East.	Rain.
10	7 a m	44	29,000	S. W.	Rain.
	1 p m	47	28,995	South.	Cloudy.
	7 p m	48	28,990	Calm.	Cloudy.
11	7 a m	50	29,000	South.	Cloudy.
	1 p m	55	29,046	S. W.	Cloudy.
	7 p m	55	29,064	S. W.	Cloudy.
12	7 a m	52	29,093	S. W.	Cloudy.
	1 p m	54	29,038	S. W.	Cloudy.
	7 p m	53	29,035	S. W.	Rain.
13	7 a m	53	29,060	S. W.	Rain.
	1 p m	51	29,120	S. W.	Cloudy.
	7 p m	50	29,117	S. W.	Cloudy.
14	7 a m	56	28,820	S. W.	Rain.

Date	*Hour*	*Ther.*	*Barom.*	*Wind*	*Weather.*
14	1 p m	55	28,930	S. W.	Rain.
	7 p m	44	29,040	West.	Rain.
15	7 a m	31	29,205	West.	Overcast.
	1 p m	38	29,215	West.	Light clouds.
	7 p m	40	29,145	S. W.	Cloudy.
16	7 a m	42	28,750	S. W.	Rain.
	1 p m	49	28,635	S. W.	Rain.
	7 p m	38	28,825	S. W.	Cloudy, blustering.
17	7 a m	31	29,015	N. W.	Cloudy.
	1 p m	35	29,085	N. W.	Clear.
	7 p m	29	29,095	N. W.	Clear.
18	7 a m	23	29,020	S. W.	Clear.
	1 p m	39	28,975	S. W.	Light clouds.
	7 p m	34	28,864	S. W.	Cloudy.
19	7 a m	37	28,827	S. W.	Cloudy.
	1 p m	38	28,860	S. W.	Cloudy.
	7 p m	28	29,000	N. W.	Clear.
20	7 a m	12 1-2	29,180	N. W.	Clear.
	1 p m	31	29,165	S. W.	Clear.
	7 p m	26	29,126	West.	Clear.
21	7 a m	19 1-2	29,215	West.	Clear.
	1 p m	26 1-2	29,300	N. W.	Clear.
	7 p m	22	29,293	West.	Clear.
22	7 a m	19	29,246	S. E.	Clear.
	1 p m	42	29,130	S. W.	Overcast.
	7 p m	39 1-2	29,116	S. W.	Cloudy.
23	7 a m	39 1-2	29,150	S. W.	Cloudy.
	1 p m	48	29,230	S. W.	Overcast.
	7 p m	35	29,238	S. W.	Clear.
24	7 a m	28	29,267	Calm.	Clear.
	1 p m	48	29,148	S. W.	Cloudy.
	7 p m	45	29,090	S. W.	Overcast.
25	7 a m	46	28,920	S. W.	Rain.
	1 p m	53 1-2	28,873	South.	Cloudy.
	7 p m	52	28,854	S. W.	Cloudy.
26	7 a m	51	28,900	S. W.	Cloudy.
	1 p m	54	28,856	S. E.	Cloudy.
	7 p m	52 1-2	28,800	S. W.	Rain.
27	7 a m	53	28,530	S. W.	Much rain.
	1 p m	53 1-2	28,560	South.	Cloudy.
	7 p m	34	28,770	West.	Clear.
28	7 a m	24	29,165	West.	Clear.
	1 p m	33 1-2	29,225	West.	Clear.
	7 p m	29	29,263	West.	Light Clouds.

Date	*Hour*	*Ther.*	*Barom.*	*Wind*	*Weather.*
29	7 a m	20	29,354	South.	Clear.
	1 p m	31	29,366	West.	Clear.
	7 p m	33	29,314	West.	Cloudy
30	7 a m	32	29,240	West.	Clear.
	1 p m	49	29,248	West.	Clear.
	7 p m	41	29,200	West.	Light clouds.
31	7 a m	42 1-2	29,138	S. W.	Cloudy.
	1 p m	47	29,095	S. W.	Rain.
	7 p m	48	29,028	S. W.	Rain.

Greatest height of Thermometer			70 degrees.
Least	do	do	12 1-2 degrees.
Mean	do	do	42 degrees.
Range of	do	do	57 1-2 degrees.
Greatest height of Barometer			29,354 in.
Least	do	do	28,530 "
Mean	do	do	29,054 "
Range of	do	do	,824 "
Days of clear weather			6 1-2
Days of cloudy	do		14
Days of rain			5 1-2

REMARKS.

The state of the weather during the months of December and January, has been without example in the recollection of our oldest citizens. There were but eight days of clear weather in December, and near the middle of the month we had clouds and rain for sixteen days in succession. The thermometer ranged from 32 to 60 degrees, but generally from 40 to 55 degrees. Vegetation advanced rapidly until the 20th of January, at which time the buds of the peach tree began to show colour; the frost now gave it a partial check, but mild weather recurring, it has continued to advance until the present time; the rose bushes and honeysuckles may now be seen partly clothed with foliage, and several kinds of flowers in full bloom in our gardens. Should this state of things continue much longer, we anticipate disastrous consequences to the vegetable products of the season.

MISCELLANEOUS SELECTED MATTER.

Effect of Arsenic in preserving from decay the bodies of those poisoned with it.—At a trial which took place in Edinburgh, during February last, of a Mrs. Smith for the murder of her servant maid by poison, some contrariety of opinion, as delivered in evidence, occurred between Dr. Christison, Professor of Medical Jurisprudence &c. in the University of Edinburgh, and Dr. Mackintosh, Lecturer on the Practice of Physic &c. in that city. This diversity of sentiment on several subjects, has elicited a controversy between those gentlemen, and in defence of his evidence on the antiseptic properties of arsenic, Dr. Christison makes the following observations.

"I shall not enter at full length into the subject here: I shall not attempt to ascertain under what conditions arsenic acts as an antiseptic,—*for it does not always act as such;* but will confine myself to some facts which will prove that it is sometimes a preservative from putrefaction.

I need hardly say that arsenic is used for preserving the skins of birds and beasts. *Guyton-Morveau*, the celebrated French chemist, made some express experiments, and arrived at the conclusion, that arsenic is a powerful antiseptic for articles to which it is immediately applied. Even the solution is antiseptic. In an experiment which I have made among others with a view to publication, a portion of an ox's stomach has been kept for three years in a solution of arsenic, without undergoing any change, except that it has become whiter and somewhat shrivelled.

To come, however, more directly to the point, namely, to *the effect of the poison in preserving from decay the bodies of those poisoned with it.*—In the case of a man who was poisoned with arsenic, and whose body was kept *nine* days before it was buried, and disinterred and examined *seven* days after that by the late Professor Metzger of Konigsberg, in his day the greatest medical jurist in Germany, "the body, to his astonishment, was so fresh, that he could not discover any sign of putrefaction outwardly or inwardly. A case somewhat parallel was one of those which form the subject of my paper on arsenic in the Edin. Med. Chir. Trans. The body was examined *seventeen days* after death; and the morbid appearances, as will be seen

hereafter, were as distinct as in a body recently dead. In a case of poisoning with arsenic, described by Bernt, now Professor of medical jurisprudence at Vienna, the examination was not made till *five weeks* after burial; yet, although the external surface was a good deal decayed, "the bowels, to the astonishment of the inspector, were found in as fresh a state as if the man had been but a few days dead." The same conjunction of circumstances occurred in a late case examined by Dr. Borges, medical inspector for Minden: although the body had been buried *fourteen weeks*, and although the external surface had undergone the adipocirous putrefaction, and most of the abdominal viscera were reduced to a pulp, the stomach and intestines were firm, of a grayish-white colour, and contained evident crumbs of bread. A very remarkable set of cases of the same kind became the subject of judicial inquiry at Munich in 1809–11, and have been related by Dr. Bachmann, medical inspector at Culmbach. A lady near Bayreuth died apparently of some disease of the intestines. But afterwards, a variety of circumstances having excited a suspicion that she had been poisoned by her maid, a judicial inquiry was set on foot; and in consequence the maid came under suspicion of having also poisoned first another lady, and afterwards a gentleman, with whom she had been successively a servant. The bodies were examined *five*, *six*, and *fourteen months* after interment. The external parts had in all undergone the adipocirous putrefaction; but in the two last of them the stomach and intestines were so entire as to allow of their being tied, taken out, cut open, handled, &c. In two of them, the first and the last, arsenic was detected. Another similar set of cases, which occurred at Berlin in 1803, gave rise to several interesting essays and express experiments, and first drew the attention of the German medical jurists to the subject. The widow of a certain Privy-Councillor Ursinus, having attempted to poison her servant, suspicions arose regarding the sudden death of three persons in her family—a young officer who had carried on an amour with her—her husband—and an aunt, from whom she derived a considerable inheritance. The husband had been buried *two years and a half* before at Berlin, and the aunt above *two years* before at Charlottenberg. The bodies were disinterred by Dr. Welper, medical inspector for Berlin, and found dried up, but not putrid. Dr. Welper afterwards got one of his friends to make some experiments on animals poisoned with arsenic; and the results were analogous. In dogs poisoned with arsenic, and buried for *two months*, the flesh and alimentary canal were found *red and fresh, as if pickled*; and though the cellar in which they were buried again was flooded for *eight* months after, the intestines were eventually

found entire and red, while all the soft parts of dogs killed by blows, by corrosive sublimate, or by opium, and buried in the same place, were converted into a greasy mass. Another experimentalist, Dr. Kelch of Konigsberg, buried in February the internal organs of a man, who had died of arsenic, and whose body had remained without burial till the external parts had begun to decay; and on examining the stomach and intestines *five months* afterwards, he found that the hamper which contained them was very rotten, but that "they had a peculiar smell very different from that of putrid bowels,"—"were not yet acted on by putrefaction,"—"and were still as fresh as when they were taken from the body, and might have served to make instructive preparations." Nay, "they had lost nothing of their *colour*, *glimmer*, or *firmness*."

These facts, collected chiefly by sworn officers, the most eminent physicians in their respective districts, and in judicial inquiries, will prove sufficiently that arsenic has sometimes a preservative power over the stomach and intestines of persons poisoned with it."—*Ed. Med. & Surg. Jour. No.* 92.

Secret Remedies—We have read with great satisfaction the "Reports of the Medical Society of the City of New York, on Nostrums or Secret Remedies." The first article noticed is CHAMBERS' *remedy for intemperance*. Drs. HAMERSLEY, DRAKE, MANLEY, WATTS, IVES, and JOHNSON, the highly respectable committee to whom this subject was referred, inform us, that they employed Dr. G. Chilton, an able and experienced chemist, to analize the medicine, and that the results of his experiments show it to be composed of tartar emetic, capsicum, sulphur, carbon, cochineal, and gum. "If any doubt," say the committee, "could rest upon this result to which the analysis leads, it could not fail to be removed by the collateral evidences which may be brought in confirmation from its exhibition both internally and externally—its effects upon the stomach and bowels are precisely those which ought to be expected from tartar emetic, and externally applied, it will produce the pustular eruption which is peculiar to this metallic salt." This medicine then owes any efficacy it may possess to the tartar emetic which it contains—of its value, therefore, as a remedy for intemperance, or of the danger of fatal consequences resulting in some cases from its exhibition, we need not here speak—every professional man will know how to estimate it.

The third report is drawn up by Drs. Pascalis, Hamersley, Drake, Manley, and Watts, and is on SWAIM'S *Panacea* and the other *depurative syrups*—the *Columbian Syrup*, PARKER'S *Vegetable Panacea*, POTTER'S *Catholicon*, SHINN'S *Panacea*, SCOTT'S *Panacea*, WILSON'S *Panacea*, &c. all of them essentially the same. This report displays great ability and research, and is the most interesting of the three, from the extent of the evil which was the subject of investigation. It appears, (vide Report, page 34,) that about the year 1811, Dr. Berger, the elder, was joined in consultation with several physicians of New York, in the case of a gentleman labouring under a loathsome complication of disease, the sequelæ of syphilis, and the repeated and irregular use of mercury, which had resisted all the ordinary modes of treatment, and at his, (Dr. Berger's) suggestion, the rob of Laffecteur was given, and with good effects. "The remarkable recovery of this gentleman, and the difficulty of obtaining an adequate supply of the rob for extensive use, owing to the restrictions that at that time existed in our commercial intercourse with Europe, led Dr. McNeven, who was one of the physicians in the consultation, to give publicity to its composition and its

worth. He accordingly published in the third volume of the Medical and Philosophical Journal and Review, the recipe of M. Allion, a French chemist for its preparation. The remedy prepared according to this recipe, with the exception of substituting the bark of sassafras, or the shavings of guaiacum for the marsh reed-grass, was soon after employed by several of our city practitioners, with the usual happy results. Among many patients, Mr. SWAIM, then a book-binder living in this city, experienced its beneficial effects *in his own person*, and soon after succeeded in obtaining from Dr. N. J. Quackinboss, the practitioner who had administered it to him, the recipe for its formation and the directions for its employment; whereupon he removed to Philadelphia, and set forth his vegetable syrup, which he denominates Swaim's Panacea, for the treatment of those diseases for which the rob has been so long celebrated. In the first instance, Mr. Swaim's directions for using his panacea, for preparing the sarsaparilla ptisan, and the quantity and times of taking it, in conjunction with the syrup, were the same, nearly verbatim, as those given by Dr. McNeven, in the publication above referred to, for the use of the rob, but of late he has altered his directions considerably, and has ceased to insist on the conjoined use of the sarsaparilla ptisan, even in small quantities. The flavour of the sassafras in the syrup first prepared by Swaim was very perceptible, but it is now the opinion of many, that he has substituted the leaves of the Pipsisewa, (Chimaphila corymbosa of Pursh,) for the marsh reed-grass, sassafras or guaiacum, which we think very probable. However this may be, the syrup also contains the oil of winter-green, (ol. gaultheriæ,) for its flavour is evident, both to the smell and taste. Swaim's object in this addition, is, doubtless, to disguise the other materials, and to render the medicine agreeable to the taste, but it may also be a useful addition as a stimulant and carminative, obviating that loathing and disgust of the medicine, which sometimes occurs from its long-continued use."

That the sarsaparilla in the form of a syrup or decoction alone, and when combined with corrosive sublimate, is a very valuable remedy in several forms of disease, is known to every medical man; it has been long in familiar use by the profession—but that the last combination, unless administered with discrimination and judgment, is often productive of the most fatal consequences, is equally well known, and that this must be the case, must be evident to every one who is acquainted with the highly poisonous properties of the chloride of mercury.—*Amer. Med. Jour. No.* 1.

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ORIGINAL COMMUNICATIONS.

ART. I.—*Cases and observations on Convulsive Affections.* By JAMES CONQUEST CROSS, M. D. of Courtland, Alabama.

FACTS discovered and observations judiciously made, have, in every age distinguished for the rapid advancement of medical science, been uniformly esteemed among the most valuable and durable accessions to the "art of healing." Classified and systematic views of morbid phenomena have, no doubt, contributed considerably to enlarge the sphere of medical philosophy, and have been mainly instrumental in the wide diffusion and comparatively easy attainment of a knowledge of the art of curing diseases. I have yet however to be persuaded, that such labours deserve to be ranked with those whose only object is to accumulate and furnish facts divested of sectarian prejudice and hypothetic bias, to collect observations by actual experience in the chamber of affliction, and to report them, with honest unaffected candour, without an immediate or remote reference to any particular doctrine contained in the codes of physiology or pathology. Faithfully to observe the movements of nature, and, with determined integri-

ty, record the results obtained, is one of the most difficult and trying duties that devolve upon a practitioner of physic. To tell the truth, it may be urged, is no arduous undertaking. I wish it were so; but my experience convinces me, that a man may be anxiously and even religiously disposed to subserve the real interests of the science, even to the entire subversion of a favourite hypothesis, and yet be unable completely to divert his reflections from the channel in which they have been accustomed with peculiar pleasure to flow; to renounce for the moment all thought of the ultimate effects likely to be produced by the operations going on under his observation, and resolutely to determine not to see or suffer himself to fancy the existence of any thing that does not come directly under the inspection of his visual faculties, or within the certain reach of some one or more of his other senses. When, however, sufficient self-denial can be commanded to execute the important and difficult duties devolving upon a faithful and honest reporter, it cannot be denied that he is in a fair way to be ranked among the most distinguished and useful of the benefactors of mankind. His labours, though not very splendid, are nevertheless clothed in the form and lineaments of extensive utility, and will serve, when the wild and lawless conjectures of his more daring and brilliant rivals have been consigned to the dark temple of never ending forgetfulness, as lights to direct the uncertain and wandering footsteps of the practitioner. These considerations, without believing myself endowed with the happy capacity necessary to the character of a recorder of cases, have induced me to lay before the medical public the following cases, as exhibiting many curious and interesting phenomena, which may perhaps contribute to illustrate the history and character of disease, and render more precise and certain the principles upon which its treatment should be regulated.

Puerperal Convulsions. If we account the faithful history of diseases generally, as valuable, that which has for its object the exposition of convulsive affections, must be esteemed peculiarly interesting; for our knowledge of their pathology is less perfectly understood than that of any other class of

diseases, and their treatment is infinitely more vague and uncertain. The discrepancy of opinion on this subject is so remarkable, that physicians have not been able to settle down upon a single principle, which can be considered as based upon certain and permanent data; and while this is undoubtedly true of convulsions generally, it is emphatically and lamentably so, when we turn our attention to that species peculiar to lying-in women. A *coup d'oeil* of the different doctrines prevalent on the subject of its pathology, is all that is necessary in order to be convinced that this remark is literally true; for while they differ widely in principle, they lead to directly opposite modes of treatment. It is a law recognized by nature, that a multiplicity of effects may proceed from the same cause; but it is paradoxical and a direct violation of her laws, to refer the same effect to several different causes. If this be a correct criterion by which we are enabled to form an estimate of the extent and correctness of our knowledge on the subject of disease, I am sure no malady presents more conclusive data than puerperal convulsions. While La Motte, Puzos and Osborne are earnest in the belief that puerperal convulsions are dependant on irritation of the uterine fibres, and recommend instantaneous delivery as the only effectual means of saving the patient's life; while Garthshire and Hull, desirous of amalgamating and confounding them with common epilepsy, condemn the practice of La Motte, &c. and rely with exclusive confidence upon the unaided exertions of nature; and Bland, contending that the nature and character of the disease is purely nervous, considers the sheet-anchor of hope to consist in the free use of opium, Baudelocque, Burns and Dewees, looking with the partial eye of parental affection to excessive vascular plenitude, earnestly conjure us to esteem the abstraction of blood, *pleno rivo* and repeated *pro re nata*, as the only palladium of the patient's safety. Thus it must appear at once clearly demonstrated, that the theory and practice of puerperal convulsions are based upon no certain or fixed principle, that our knowledge of its seat and nature is groundless speculation, and its mode of cure in a great measure empirical.

To contribute my feeble assistance to the removal, if possible, of this dangerous discrepancy of opinion from the practice of the art; I venture the publication of the following cases, evincing the powers of a drug, which, though formerly suggested and warmly recommended in puerperal convulsions, has been denounced by a number of individuals of great obstetrical eminence. This entire abandonment I cannot but consider injudicious and precipitate; for, though they have succeeded in excluding it from puerperal practice, the very equivocal success of those remedies by which it has been superseded, proves clearly that they have not been fortunate in the introduction of more efficient means: for while in some instances, immediate delivery, the uninterrupted and unaided efforts of nature, or the copious abstraction of blood have been successful, the numerous cases in which they have entirely failed, shew convincingly that they are incapable of mastering the disease when presented under its most aggravated forms.

Case 1st. I visited a slave of my fathers, æt. 33, of full habit of body, generally healthy, who was in the seventh month of pregnancy, and was supposed to be on the eve of abortion. In the morning, about three hours before I saw her, she complained of very troublesome vertigo, headach, dimness of sight, and the floating of black specks before her eyes, and a curious pricking of the right half of her tongue, which impaired considerably its gustatory power. A numbness and sensation of deadness pervaded the whole of the right side; this side had been for several days previously, incapable of carrying on the secretory function of the skin; it was then and had been excessively dry, and to the hand appeared to be of a reduced temperature, while the left side was very frequently affected with flushes of heat, which were very generally succeeded by a gentle perspiration. Convulsive and irregular efforts of the muscles of the inferior extremities, had been observed during the whole previous part of the day, but so inconsiderable as not to receive much attention, believing they did not indicate any thing of importance. These spasms, though they did not increase progressively in intensity, as might have been expected, were much more vehement in the left leg than in the right,

and in the former the gastrocnemii were chiefly affected. The preceding circumstances induced me to apprehend the occurrence of hemiplegia. The stomach laboured under great sickness, and was occasionally inverted in its action; deep seated and violent pain occupied the vicinity of the umbilicus; the bowels were in a state of excessive constipation, and had been so during the whole period of her pregnancy, except when under the operation of cathartics. These had been neglected for the past week, during which time she had not had an evacuation, with the exception of one which was hard and scanty. The pulse was full, slow, and the heart appeared to labour considerably. Twelve ounces of blood were taken away, an active cathartic was given, together with an enema to facilitate its operation. At 12 o'clock her situation was unaltered; although the bleeding made for a time an impression upon the heart, this did not last long; the pulse was still slow, full and laboured, and the bowels had not acted. Twelve ounces more of blood were taken, and the enema was ordered to be repeated. At 1 P. M. I was hastily called, and found labour approaching; at distant intervals she had slight pains. Still no impression had been made upon the heart or bowels, and the other symptoms continued unchanged. The enema was repeated, and I was preparing to open a vein again, when she had a most violent and effective pain, which with a second, quite as intense, completely expelled the child. It was dead and in a state of commencing putrefaction. Though the labour came on in the seventh month, I made no effort to arrest its progress. As this was the ninth child she had had in the course of about ten years, as they had all been still-born or abortions, I conceived that it would answer no good purpose, to endeavour to postpone the labour or suspend the action of the uterus. There was no evacuation of liquor amnii, and suspecting the membranes had been ruptured and the waters passed off before the commencement of labour, I made minute inquiry, but could discover no circumstance to induce the belief that such had been the fact; nor was there hemorrhage before, during or subsequent to delivery. Scarcely had I divided the umbilical cord, when she was seized with violent convulsions,

which lasted without intermission about ten minutes. The secundines still remained undelivered, and while my hand was in the uterus to effect their removal, a second convulsion occurred, when I conceived it a fit opportunity to ascertain in what manner that organ acted in puerperal convulsions. It is said by Dr. Clarke "that instead of a regular contraction taking place, the uterus seemed to flutter, or be irregularly and tremulously contracted and relaxed again quickly, and he was disposed to believe that it was in that state during every case of puerperal convulsions." When I introduced my hand, I found the placenta and its appendages entirely detached from the parietes of the womb, and resting at the posterior part near the fundus; the organ itself was loose, flaccid and uncontracted. During the existence of the paroxysm my hand explored every part of the uterus, but no change in it could be detected except at the cervix, where it slightly, and almost imperceptibly embraced my wrist more closely than it had done before. Whether this is the usual condition of the organ "in every case of puerperal convulsions" I am unable to say, as my experience is too limited to entitle me to an opinion, and as I am not aware that the same has been asserted of the uterus by any other individual: I am certain, however, that it does not seem to "flutter or be irregularly contracted and relaxed again quickly, in every case."

It would be better, perhaps, to give a short outline of the great features of this case, before those remedies are detailed which were employed. This is the more absolutely necessary, as without it the reader will be destitute of a knowledge of the state of the system when they were exhibited. The pulse, though a little softer and more frequent than at the two bleedings alluded to, was but little altered in its general character; the intestinal tube seemed as if it had been hermetically sealed, for though croton oil, and enemata had been frequently repeated, no evacuation had been produced; she complained of violent pain at the back part of the head; she had occasionally bled at the nose to the amount perhaps of eight ounces in all; the paroxysms lasted upon an average about ten minutes and the intervals between them about five. The paroxysms con-

tinued to increase in vehemence for five or six hours, when I commenced the exhibition of the article that eventually succeeded in entirely checking them; from that time, for about the space of four hours they were thought progressively to decline in strength, when they altogether subsided. During the existence of the convulsions the jaws were firmly locked, hands clenched, the arms and legs perfectly rigid and the muscles of the abdomen and chest, in common with the rest of the body, spasmodically affected. She foamed at the mouth, and as the fits decreased, and the muscles controlling the movements of the jaws acquired more latitude of motion, she frequently gnashed her teeth together with great violence, which made it necessary to insinuate a small piece of wood between them, to prevent the tongue from injury. Her eyes rolled upwards and backwards, presenting their sallow whiteness, which often induced her attendants to suppose her in the agonies of dissolution.

So warmly have the espousers of the lancet recommended it to the unconditional adoption of the profession, that although I had never seen a case of puerperal convulsions before, nor had any practical evidence of its utility, I did not hesitate to employ it, to any extent which the emergency of the case called for or might seem to justify. A vein in either arm was opened, from which thirty-six ounces of blood were taken away, when syncope was produced. The moment fainting took place, the convulsions ceased, but this was for an instant only; as they returned immediately she was restored. Three other paroxysms of increased violence intervened before I had recourse to the lancet again, but only twelve ounces could be procured before syncope returned. The convulsions continued unabated for an hour, when I thought it advisable to take more blood, but could obtain only eight ounces before she fainted, nor was it possible to push this remedy farther; for the moment the blood began to run the same phenomenon was manifested. From this remedy, I am persuaded, although she had lost upwards of ninety ounces of blood together with what came from her nose, she did not derive the smallest benefit. It is possible it may have prevented the disease from at once sacrificing her, but never could have been instrumental in removing it, as under its employment every fit seemed to bring with it additional violence.

The obstinately constipated condition of the bowels induced me, very early in the disease, to suspect that they were in some way active in its production and perpetuation, and though I had made frequent ineffectual efforts to remove their torpor, I determined to resort to the most stimulating enemata, and the free exhibition of croton oil to accomplish my purpose. Every exertion, however, as far as immediate advantage was concerned, proved abortive; the former in every varied form that could be imagined was exhibited, and the latter in doses of three drops, till twelve had been taken, was given without producing the desired effect; nor could an operation be effected till fourteen hours after the convulsions had ceased, and was accomplished then by large and repeated doses of the oil of turpentine. The opium that was subsequently used, may be supposed to have been in part instrumental in producing or keeping up this unaccountable condition of the bowels: it should be recollected however, that constipation had existed to a greater or less extent during the whole pregnancy, and also that repeated and very energetic measures had been adopted to effect their relaxation, several hours previous to our bringing them under the constipating influence of opium. It may not be unimportant to remark, that the sphincter ani was so closely contracted during the existence of the paroxysms, as to make the introduction of an injection into the rectum impracticable, and even during the intervals it was a matter of serious difficulty.

Emetics having been recommended by Le Preux, Hoeffner, Schenck, and particularly by Dr. Joseph M. Smith, in various convulsive affections, I was induced to have recourse to them, particularly as I had been so unfortunate in the employment of the lancet. My patient was repeatedly puked, but if she derived any benefit from the operation, it was so inconsiderable as not to be discovered. Mr. Burns is not partial to the exhibition of this class of medicines: he is apprehensive of their deleterious effects upon the brain; I did not, however, observe that the determination of blood to that organ was increased, or that the violent headach was augmented.

Camphor, in conjunction with the other remedies used, was exhibited from the onset of the disease in doses of from three

to eight grains during the first four hours, until about two scruples had been taken, but without realizing the benefit we had been taught to anticipate from the extravagant encomiums of Dr. Hamilton.

Upon the recommendation of the venerable Dr. Denman, and being extremely partial to the remedy ourselves, from having observed its prompt and decisive effects in several other affections, we most willingly had recourse to sprinkling the face with cold water. This remedy was employed during every paroxysm for the first four or five hours, but without obvious advantage.

The hip-bath was repeatedly used, as well as friction with the naked hand and the most stimulating substances, but ineffectually.

When the virtues of the preceding remedies had been amply put to the test, six hours had elapsed from the commencement of the disease, and I became convinced that I might as well attempt to wrench the club from the iron grasp of Hercules, or move the everlasting hills from their foundations, as expect to save by such means the life of my patient, which seemed every moment approximating the brink of the grave. Some untried remedy must present itself, I felt convinced, or she would in a short time be removed far beyond the reach of human skill. Reflecting upon the resources that still remained unexhausted, I found them restricted within the very narrow compass occupied by the very equivocal, not to say hazardous, powers of opium. I recollected the positiveness with which it had been denounced; I recollected that M. Petit affirms that it kills both mother and child; that Dr. Hamilton asserts that no patient to whose assistance he had been called, who had taken a dose of opium previously to his arrival, had ever recovered; that Mr. Burns says it tends to convert the disease into fatal apoplexy, and in general should be avoided as the most fatal agent which can be employed; and that Dr. Dewees denounces it as a fatal practice. These were discouraging recollections, and sufficient, but for the peculiar situation in which I was placed, to deter me from resorting to so hazardous a practice. In the first place, I had failed in every

attempt made to relieve the convulsions; secondly, they clearly demonstrated a fatal tendency unless they could be promptly and decisively arrested; thirdly, from the firmness with which the jaws were locked, I was induced to believe that there was some analogy between them and tetanus, and that should my suspicion be founded in truth, I knew of no remedy that would more effectually shield my patient from the very imminent danger with which she was threatened; fourthly, though opium had been condemned in the most unequivocal terms by the most distinguished obstetrical authors, I knew it had not been uniformly proscribed, and hoped that Dr. Bland had not recommended it upon fallacious or apocryphal evidence of its utility; fifthly, should there be real hazard of producing dangerous determination to the brain, in the onset of puerperal convulsions, I believed I had depleted so largely, as effectually to avert an accident of that sort; and lastly, I felt pretty confident that if it should aggravate the disease and threaten dangerous consequences, I had at command the means of immediately counteracting them.

The situation of my patient, when I commenced the administration of opium, may be comprised in the following brief sketch. The pain in her head and vicinity of the umbilicus was unabated; pulse quick, small and frequent; the paroxysms augmented in intensity; jaws so firmly fixed upon the wood between them, as to be almost immoveable during the intermissions; deglutition unimpaired; intermissions shorter and paroxysms longer; more intellectual hebetude and considerably more stupor than had been manifested at any preceding period.

I felt a strong conviction that the antispasmodic powers of opium were such as to enable it, if exhibited in sufficiently ample quantity, permanently to relax the muscles; but I had reason to apprehend that the amount which might be necessary to answer this purpose, would be so great as to destroy my patient at the same time that the convulsions were subdued. How to prevent this circumstance was a desideratum. I did not doubt I could save my patient, provided she survived the convulsions a single hour: how to procure this event, was a

matter of some uncertainty and a source of considerable uneasiness. Reflecting, however, upon the virtues of cold water in counteracting the poisonous effects of this drug, I thought it probable that by exhibiting them in conjunction, after the system had been brought pretty well under the influence of the narcotic, I could retain within innoxious limits its deleterious effects, should they be developed. I determined, therefore, to exhibit the opium until a manifest impression had been made upon the disease, and then associate it with the free employment of cold affusions. Having settled this plan, I commenced during the intermissions, the administration of opium, and gave it in as large quantities as was practicable in the rigid state of the muscles of the jaws, until a paroxysm was announced, and then suspended its use until its cessation. Only two paroxysms had occurred after opium had been employed, when I thought that I could observe a more protracted intermission, and reduced violence in the paroxysms. In the course of an hour, there was an evident amendment; for although she had moved her jaws with the greatest difficulty since the occurrence of the first paroxysm, and had not articulated a single word so as to be understood, she now separated her teeth with more ease, asked for another pill, and exclaimed, "the cramps are going off." The convulsions, however, still continued to return at more distant intervals and with less intensity for about half an hour, inducing the belief that they would soon entirely subside. Thinking it prudent to anticipate the poisonous effects of the opium, I now used cold affusions in conjunction with it. This course was pursued for an hour, at the expiration of which time, however, I observed that the severity of the paroxysms did not decline as I had been taught to expect from the partial success I had already derived; indeed they very soon, under the exhibition of cold affusions, appeared obviously to recover strength. This I at once attributed to the power which I knew cold water exercised over opium, and immediately directed its entire abandonment, exhibiting the latter alone, determined to await the result, and rely upon checking its evil effects should they appear, by the prompt use of the former. No sooner had I a second time brought the

system under the full operation of this powerful narcotic, than I began again to realize its salutary effects, which I kept up, though in gradually reduced doses, for an hour and a half; soon after which, the convulsions entirely ceased. Scarcely had this most desirable result been produced, when, as was anticipated, I discovered I had another affection to encounter, which would have presented an alarming state of things, had I been in possession of no other remedy than the usual routine of practice in such cases. The condition of the system, however, which was now present, was soon divested of its terrors by the prompt and decisive application of cold affusions; the deleterious impression made by the opium soon disappeared, and the individual, as far as the convulsions and opium were concerned, was restored to entire health. As this case presents some other interesting features with respect to the virtues of cold water in removing the poisonous effects of opium, I shall reserve the details for another paper, in which it is my intention to dwell more at length upon that important subject.

The reader will no doubt be surprised when I tell him, that I gave in this case, no less than one hundred and five grains of opium. I am sure the amount is not exaggerated, however incredible it may appear; for although I did not weigh the drug as it was exhibited, nor could I form at the time any probable estimate of the amount given, I was enabled most perfectly to satisfy myself in that point; for, having procured from my druggist the day before, precisely one ounce, not a grain of which had been used in any other case, when it was weighed again the quantity just alluded to was wanting. Apprehending some mistake had been made in the quantity I received, I called upon the druggist, who assured me he was very certain I had not received less than an ounce. Having the utmost confidence in the integrity with which Mr. Sanders (the druggist alluded to) conducts his business, I have no hesitation in believing that the enormous and almost incredible amount supposed to have been given is not exaggerated, either through error on his part or culpable intention on mine.

It may not be unimportant to remark, that the subject of this case, though she has had nine still-born children, all in a state of incipient putrefaction, has since had, by the assiduity and attention of her mistress, who was careful to keep her bowels soluble and her system free from plethora, a strong healthy child at the usual termination of utero-gestation.

In this case, the following highly important and interesting features cannot fail to challenge attention. First, the peculiar hemiplegic symptoms which preceded and seemed to be premonitory of labour, but were really harbingers of convulsions; secondly, the obstinacy with which the circulation retained its vigour under the repeated use of the lancet; thirdly, the excessive and unyielding constipation of the bowels; fourthly, the total absence of liquor amnii, and of hemorrhage; fourthly, the perfect quietude of all the uterine muscles except those about the cervix, while those of all the remainder of the body were agitated by violent convulsions; sixthly, the entire inefficiency of very extensive bleeding as far as could be judged from appreciable effects; seventhly, the general inefficacy of the other remedies recommended in such cases; and lastly, the manifest and signal advantage derived from the bold use of opium, this advantage as promptly lost by the application of cold affusions, and its final and complete triumph after the entire abandonment of the latter.

I have been prolix, and perhaps unnecessarily minute in the details of this case, but it was my object, as far as my own knowledge extended, to make known all the circumstances by which it was attended, that those of more enlarged experience and more mature judgment, might with all the data before them, be enabled correctly to judge of the merits of the practice pursued. It was bold and I am ready to admit precipitate and perhaps imprudent and hazardous; but with my limited experience, and opinions in a great measure uninformed on the subject, I am under the impression that no other known remedy in her extremely perilous situation could have saved her life.

Case 2nd. Since the occurrence of the above case, I visited a woman who was attacked in the eighth month by puerperal convulsions. She was 25 years of age, of delicate and frail

habit of body, excessively nervous and possessed great sensibility. She was pregnant with her fourth child, and had, with the three preceding, happy labours; no untoward circumstance happening before, during or subsequent to delivery. It appeared, however, since the birth of her third child, that she had been exposed to her husband's unaccountable and groundless jealousy, which afflicted her extremely, particularly as he often declared to her, that he was not the father of the child with which she was then pregnant. The birth of her child was an event to which she looked with great anxiety, and the alarm and agitation to which this circumstance gave rise, contributed considerably, no doubt, to produce the convulsions under which she laboured. In every other respect, she appears to have enjoyed her accustomed health. She was attacked about 4, P. M. and had not experienced any uneasiness during the previous part of the day, except slight pain which seemed to shoot from the lower part of the os frontis, in the direction of the longitudinal sinus, to the most posterior part of the os occipitis. The first sensation that made an impression upon her mind, was a considerably severe pain in the region of the stomach, which was soon followed by nausea and vomiting, in which operation she fainted. The features of her face were very much distorted, and the deep asthmatic breathing clearly indicated that the muscles of the chest, and probably those of the diaphragm, were convulsively affected. The abdominal muscles were also agitated, but not with so much violence as those of the face and thorax. Those of the extremities did not participate in the disease at all. The face was pale and bloodless, the eyes hollow, the extremities cold, and the pulse small and frequent. The paroxysms were short and succeeded each other with rapidity, and sometimes between the fits deliquium animi took place.

This case did not admit of the use of the lancet, and having confidence in no remedy but opium, when the condition of the system excluded blood-letting, and discovering that none of those circumstances were present which are considered unfriendly to its success, I did not hesitate a moment about the propriety of the course to be pursued. I immediatly exhibit-

ed four grains of opium, and repeated two every half-hour until the convulsions were subdued. Very soon the propriety of the practice became manifest: only twelve grains had been given when the paroxysms began to decline in violence and to observe more protracted intermissions. The syncope which several times occurred during the intervals, did not return after six grains had been given, and when eighteen had been taken, the convulsions appeared to have lost so much of their violence as to render its further employment unnecessary. In the course of an hour after the opium had been abandoned, the disease entirely disappeared, and did not return again during gestation which terminated in fourteen days afterwards. The child was still-born, and had been dead in all probability several days. No efforts were made to deliver; the os uteri was examined but I found it closed, and I did not consider it prudent to use forcible means to open it. It was not necessary to resort to cold affusions to check the deleterious effects of opium; they were inconsiderable and passed off without presenting a single alarming symptom.

Case 3rd. So much in point is a case recorded by Dr. Simmons, that I hope I shall be excused for not omitting to give an outline of it. A lady of extremely irritable habit, who had suffered greatly by repeated miscarriages about the seventh month, and also on a former occasion had been seized with convulsions, and on that occasion had been relieved by rupturing the membranes and bringing on labour, the os internum then being sufficiently dilated, was again attacked in the same way, and an attempt was cautiously made to relieve her in the same manner; but the convulsions were so greatly aggravated by the attempt, that it was thought prudent to desist. In the medical treatment, therefore, the chief reliance was placed on opium; one hundred and eighty drops of the tincture were given within an hour, during the first paroxysms; and she was left under the gentle influence of it, for several days, even after the convulsions had ceased. In this case the muscles of the cheeks were rigidly contracted, and the jaws locked, so that the liquid was conveyed to the gullet, through the space whence a tooth had been extracted, and then she swallowed it without much

difficulty. Other auxiliary remedies were employed without abating the violence of the fits; cold water was dashed on the face, mustard poultices were applied to the feet, and blisters successively to the temples, between the shoulders, and to the calves of the legs; and symptoms threatening hemiplegia, from apparent congestion in the head, were relieved by leeches applied to the temples.

These cases offer some important suggestions not only on the subject of the pathology of puerperal convulsions, but also with regard to the practice that should be pursued. They cannot depend for their proximate cause upon irritation of the uterine fibres, for in the first case this cause did not exist, the convulsions coming on after the entire expulsion of the child; in the second, though the disease made its onset in the eighth month, and while the child was still in the uterus, it was entirely removed before labour took place; and it is contrary to the settled principles of pathology to contend, that a disease can be radically cured, and its productive cause still continue in full force. Nor can we readily believe, that they are of an epileptic character, as they frequently attack individuals who have never had convulsions, and who are not seized by them except in a subsequent pregnancy, and then they rarely if ever take place if proper precaution be observed to prevent them. They cannot be attributed to excessive vascular fulness, as in the first case here related depletion was pushed so far as nearly to paralyze the heart, yet they continued unsubdued; and in the second, the most partial defender of a favorite hypothesis, could not even have suspected the existence of such a cause. That puerperal convulsions are nervous, we cannot deny, nor will our experience justify us in coming to the important practical inference that they are. We cannot however, refrain from remarking, that we have not as yet been made acquainted with a single fact contravening this opinion, or inducing us to believe that the suggestions of Dr. Bland on this subject are false and unfounded.

The presumption may arise, from the detail of the preceding ases and the remarks by which they are accompanied, that it ay wish to recommend the indiscriminate use of opium, to

the exclusion of every other remedy, in puerperal convulsions. If so, I shall be misunderstood; for although I have, perhaps, a more exalted opinion of its efficacy than any man living, yet I am not so blinded by my own limited experience, as to suppose I have discovered a specific, or to draw the uncharitable inference, that every remedy hitherto recommended by men of the most enlarged opportunities of observation, is destitute of virtue. On the contrary, I would advise no individual to rely exclusively upon opium in such cases as the first, at least, until the practice is more thoroughly investigated and better understood than it is at present. With my knowledge of the powers of opium, and with every inducement to repose entire confidence in it, I would not for any consideration trust the life of a woman of much vascular fulness, to its exclusive agency, until at least the virtues ascribed to the lancet are found to be fabulous. It is true, I pushed blood-letting as far in the first case as circumstances would admit, or as the most hopeless and desperate case could call for, without deriving any apparent advantage; but it is impossible to say to what extent the repeated copious bleedings contributed to prepare the system for the favourable action of the opium, nor how far they shielded the brain from "fatal apoplexy." These are important matters to be definitively settled by future investigation and experience, and till then, I would most earnestly caution the inexperienced, against a precipitate resort to a drug so fraught with active and dangerous properties. I would, however, suggest to those who are much engaged in obstetrical practice, and whose judgment and experience will enable them to direct and controul the administration of what must as yet be considered a hazardous remedy, to rely as exclusively as the emergency of the case will justify, upon the powers of opium; for I cannot but be persuaded, that in judicious hands it will prove eminently useful in divesting this alarming complaint of most of its terrors. The quantity should be regulated according to the pressing necessities of the case and the effects produced; nor should any apprehension be felt on account of ultimate consequences; for it matters not what amount of opium be taken, as I firmly believe we have a safe,

sure, and prompt antidote, in the free application of cold water. The great secret of the failure which has so generally accompanied the administration of opium, not only in the disease under consideration, but in convulsive affections generally, is to be detected in the small doses in which it has been given; and this has arisen from the consequences apprehended from larger. Death will unquestionably be produced by it when given in excessive quantity, if no means are employed to counteract its mischievous effects; but no alarm should now be entertained on this score; the remedy is rendered as innoxious as the most harmless article in the materia medica. In such cases as the second and third, and especially the former, I imagine no physician would object to the immediate, prompt, and individual employment of opium; they are such in their character as not to indicate nor to bear the most partial and inconsiderable detraction of blood.

Case 4th. *Convulsions from the bite of a spider.* I saw in company with my friend and partner Dr. Gray, Jacob B. Esq. æt. 35, of thin, infirm habit of body, sallow complexion, sanguineo-bilious temperament, convalescing from chronic liver disease, who had been bitten on the glans penis, near the verge of the meatus urinarius, while at the temple of Cloacina, by a small black spider, having a very small red spot on its back. The pain produced by the bite did not exceed in intensity a smart prick of a pin, and even this soon subsided, and did not return again. The part did not swell, redden, or exhibit any other mark of having been injured, except a small black spot resembling a musquito bite. An hour elapsed before any unpleasant sensation had been experienced, and then the first premonitory intelligence he received of the approach of his disease, was by a violent, sudden, and very painful contraction of the cremaster muscle, which soon extended successively to the abdominal, particularly the recti, to the glutei, intercostal, and diaphragmatic muscles. Those of the extremities, both superior and inferior, in about half an hour after the contraction of the cremaster became convulsed. The only parts of the body that enjoyed an exemption from convulsive action, were the muscles of the neck and face, and even these at a

more advanced period, though not so violently, began to contract irregularly and quickly, which induced us to apprehend the occurrence of tetanus. Respiration was excessively embarrassed, being short, quick, and asthmatic; the skin was cold, and from the whole surface poured an abundant perspiration, which stood in large drops on different parts of the body, and on the forehead particularly; the pulse was small, thready, and vermicular; the mind was prodigiously alarmed, though it retained its usual clearness and penetration.

Emesis was produced but without benefit: a circumstance, however, of a character a little singular should be mentioned. Previous to the commencement of vomiting, the stomach was the seat of a very unpleasant sensation of cold, though warm water had been exhibited in considerable quantity to promote emesis; the antimony produced no nausea, and while the patient was under its operation, the same cold sensation extended from the cardiac orifice of the stomach to the pharynx.

In about an hour after the commencement of the convulsions, and when they appeared to be steadily increasing in intensity, the warm bath was employed, in which he was kept about forty minutes, which succeeded in producing a pretty general tranquility throughout the muscular system. In less, however, than half an hour after he emerged from the bath, they returned with redoubled violence, and threatened the most alarming consequences. The muscles of the cheeks and neck appeared now for the first time slightly affected. Thinking that if we could benumb the sensibility of the part originally injured, and from which this strange train of muscular irritability seemed to radiate, we might succeed in subduing the convulsions, upon the suggestion of Giannini we introduced a large pill of opium into the urethra, which soon moderated the symptoms and contributed considerably to encourage the belief that it would succeed in subduing the convulsions altogether. The hope, however, was fallacious and unfounded; the narcotic soon lost its influence and the convulsions resumed all their former intensity. Our chief, indeed only reliance, was now in large doses of laudanum, which we determined to push to any extent that the object to be attained might

seem to require. Half a drachm of liquid laudanum was immediately exhibited, but without obvious benefit; in thirty minutes the same quantity was repeated; still but inconsiderable moderation of the symptoms followed; in thirty minutes, same dose repeated; the impression made was now very manifest, the convulsions being considerably reduced in violence; in thirty minutes the same dose was repeated, the disease moderating so rapidly that its repetition was unnecessary, and in an hour there was no vestige of convulsions. At 12 at night, about seven hours after the infliction of the injury, two drops of croton oil were exhibited to counteract the constipating tendency of the tincture.

On the ensuing morning he was free from spasm, but experienced great soreness of the muscular system; skin comfortably warm and covered with a moderate and pleasant perspiration; pulse feeble, but fuller and less frequent; bowels costive, no operation having been produced. The same dose of croton oil was repeated. At 1 P. M. pulse full, frequent, with some hardness, but no intestinal evacuation. Bled to sixteen ounces, and three drops of croton oil ordered. Seven P. M. no alvine discharge; rectum examined and found choked with hardened impacted feces; an enema was exhibited which dislodged the obstruction, and the bowels became sufficiently active. In less than twenty-four hours he was entirely recovered.

Case 5th. *Convulsions from drinking cold water.* I visited a negro man, the property of Mrs. A—— in the neighbourhood of Lexington, whom I found labouring under strong convulsions, Upon inquiry I ascertained that he had been engaged during the day at hard work, and that about an hour before I saw him, having drank copiously of very cold spring-water he immediately complained of violent pain in the region of the stomach, and made several ineffectual efforts to vomit. He extended himself upon the ground, and was in about fifteen minutes thrown into violent convulsions. When the paroxysm terminated, which his companions supposed lasted about ten minutes, he laboured under so great a degree of intellectual imbecility, as to be incapable of returning an intelligible answer to the questions propounded. When I first saw him,

about an hour had elapsed, and he had had three fits, all of which appeared to be of nearly the same length and intensity. About sixteen ounces of blood had been drawn before my arrival, and I found him during an intermission with a pulse small and very quick, though he was an athletic man: the surface of his body was cooler than natural, particularly his hands and feet; great stupor prevailed, and when he could be aroused by loud noise and strong sternutatories, his look was wild and without expression; nothing but an unintelligible muttering could be extracted from him. When uninterrupted his eyes were constantly closed, and he would suffer his eye-lids to be separated when not exposed to light; but the moment a lighted candle approached him, he would close them, and with considerable violence which seemed to extend a kind of shuddering over his whole body. Nothing of this kind was observed while in a paroxysm. In spite of every exertion to prevent it, he persisted in laying on his abdomen, with his face as much protected as possible from observation by burying it in his pillow. These were the phenomena manifested during an intermission: those that characterised a paroxysm were not unlike what is observed in common epilepsy. The head was vehemently agitated, alternately drawn back with great force, and then suddenly thrust forward, so as to make the chin come almost in contact with the sternum; the eyes were violently convulsed, and seemed to roll to every point of the socket without ever presenting the cornea; the lips were contracted, sometimes protruded in the form of a cone, and were generally covered with a frothy saliva; the muscles of the face generally were violently agitated, and the teeth were fiercely gnashed. Respiration was laborious, excessively embarrassed, and on one occasion threatened to become stertorous. Sometimes the urine, and once the semen, was involuntarily evacuated. These fits continued from 3 P. M. to return at pretty regular intervals until 10 at night; the intervals were generally from 15 to 20 minutes duration.

The warm bath which had been preparing before my arrival, was administered about ten minutes after I saw the patient; the moment he entered it he seemed to enjoy a release from

his sufferings; for though he groaned most piteously before, he became perfectly tranquil, and continued so during the twenty minutes he remained in it, when his extreme languor and sinking in the vessel, induced me to have him removed. Half a drachm of liquid laudanum was soon afterwards exhibited, just at the commencement of a paroxysm, with the hope of moderating and if possible entirely checking it; but in both of these expectations I was disappointed. The narcotic was repeated in drachm doses until an ounce and half a drachm had been taken. A large blister had also been applied, soon after coming out of the bath, to the region of the stomach, and pediluvia were frequently employed, being apprehensive for the consequences of a more general application of the bath, from the extreme languor and debility which had already been occasioned. The subsequent paroxysms did not appear to be greater in intensity than those that occurred at a more early period, nor did any impression appear to have been made upon them until six drachms of laudanum had been exhibited, which was about five hours after he was attacked. Every circumstance seemed now of a favourable character; the paroxysms were not so intense, nor the intellectual torpor so great. He turned for the first time upon his back, opened his eyes, and when asked how he felt, observed that he experienced no pain. The tincture was continued an hour longer, after which he had only one very slight fit. He still, however, seemed very dull, disinclined to talk, but appeared to understand what was said to him. A cathartic and an enema were ordered.

In the morning the head was in the same condition, but the stupor was removed in the course of three days, by keeping up a pretty active operation on the bowels and the use of the pediluvia. He never had before, nor has he had since, a paroxysm of epilepsy.

This case, besides illustrating the powerful efficacy of opium in convulsions, also exhibits cold water as a cause of the latter, which has never been, so far as my researches have extended, included in their etiology.

ART. II.—*Observations on the Secale Cornutum.* By WILLIAM HALL RICHARDSON, M. D. Professor of Obstetrics and the Diseases of Women and Children in Transylvania University.*

THE following communication is made not so much with a view to urge a more extensive use of the ergot in cases of difficult or protracted parturition, as to offer some suggestions, as to the circumstances in which it may be expected to produce a safe and successful operation. It is unnecessary to detain the reader with an account of the natural history of this medicine, as satisfactory information has been given to the public on that subject by several eminent physicians. Neither is it necessary to attempt the proof of its properties as a *partus accelerator*. The testimony on this point is conclusive, and goes to establish the fact, that in adequate doses, its effects are exerted on the contractile powers of the uterus, with a degree of certainty which justly entitles it to the appellation of a specific.

There being no longer any doubt in the United States as to the powers of this medicine over the uterus, the great solicitude felt by every practitioner of medicine to rescue females from the sufferings and perils of parturition, will be a strong inducement to administer it in cases of extremity. This remedy however, as well as the forceps, has been too frequently resorted to, and has more confidence reposed in it, than comports with the interests of society, or the legitimate objects of medical science. It therefore becomes a matter of the greatest importance clearly to understand the mode of its operation, and the circumstances which forbid its administration.

The dangerous effects of this valuable medicine arise, in many instances, from the impatience of practitioners in refusing to wait on the operations of nature, and by officious interposi-

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*The following essay was communicated for the first number of the Journal, but not in sufficient time for publication.—EDITORS.

tion, disturbing the regular progress of delivery, to the great hazard of the life of the child, when the undisturbed operations of the system would be successful, although a longer time would in all probability have been required.

It is a very fatal misconception of the powers of ergot, to suppose that its effect on the uterus will enable the practitioner to triumph over mechanical impediments, and by its use remove all opposing obstacles to delivery. In such cases there is the utmost danger of destroying the life of the infant, not from any deleterious properties of the ergot, but by the continued contraction of the uterus around its contents in so firm a manner as to suspend animation, by arresting the circulation through the fœtus and umbilical cord. It can scarcely be supposed that the death of the child results from any other cause, as the chief if not the only effect of ergot on the maternal system is to awaken or augment uterine contraction. I have in no instance observed it to increase the pulse in force or frequency; it appears to induce no change in the condition of the stomach or bowels, nor alter the sensibilities of other parts of the system; but exerts its powers over the uterus with as much certainty as tartar emetic excites the stomach to vomiting. All medicines will occasionally fail to produce on the system their peculiar effects: opium and tartar emetic, for instance, will in certain states of the body neither produce sleep nor excite vomiting; the failure of ergot will not be more frequent than that of either of those valuable articles of the materia medica. On this subject there is a remarkable coincidence of opinion among the practical accoucheurs of the United States; yet there appears some disagreement as to the kind of cases in which this medicine is applicable, as well as the danger to be apprehended to the fœtus from its effects.

Its employment has in no instance been recommended in preternatural labours, but has been restricted to that class in which the head is the presenting part, and of those cases but a limited number are to be successfully managed by the ergot.

With these preliminary remarks we may observe, that the first duty of the practical accoucheur, is to form an opinion of the probable result of the unassisted efforts of nature; and

when he is satisfied of their insufficiency to accomplish the act of parturition with safety to the lives and to the structures concerned in the effort, to determine what circumstances prevent the due performance of that important function.

The causes of tedious or difficult parturition have been usually and very properly arranged under two general heads. The first, when there is a want of sufficient action of the agents concerned in delivery; and the second, when mechanical obstacles retard or prevent their successful operation.

The absence of uterine action, or its feeble or inefficient power, may depend either on the condition of the uterus itself, or it may result from causes of a constitutional nature not within the reach of the ergot, and requiring medicine of a character altogether different. The want of sufficient power, as an inherent principle, is certainly an extremely rare occurrence, and its existence may be doubted. In all cases, then, of deficient or suspended action, this should be regarded as an unerring indication of derangement of the function in consequence of some morbid influence exerted on the uterus, or the effect of its exhaustion from long continued action.

Cases occur occasionally however, which authorize the opinion that constitutional peculiarities, not altogether deserving to be considered morbid, present exceptions to this general conclusion. Such cases are occasionally met with in practice, and if left alone, days of anxiety and uncertainty are consumed in tardy and feeble efforts of nature to accomplish the delivery that may be brought to a successful close in one hour by the ergot.

Debility of the general system or of the parturient organs in particular, by whatever cause it may have been induced, often gives rise to protracted parturition. Labour coming on after severe indisposition of any kind, which has exhausted the energies of the system and left it feeble and powerless, will therefore not unfrequently call for excitants to bring into successful action the agents of delivery.

The employment of these remedies in such cases, must be accompanied by all other favourable indications for a safe and successful termination, or they will disappoint the expectations

of the practitioner, and endanger the safety of his patient or her offspring.

The mechanical obstacles to delivery may be divided into two general classes, and the opposition existing in them may be regarded as relative or absolute. Under the former I would arrange a rigid state of the os uteri or other parts concerned in the process, accumulations in the bladder or rectum, excessive distension of the uterus with liquor amnii, obliquities of the uterus or a pendulous state of the abdomen, a limited disproportion existing between the dimensions of the head and the straits of the pelvis, tumours of a compressible nature, as enlargements of the ovaria, hernial tumours, polypi, &c. the presence of the hymen, adhesions of the labia, or a septum thrown across the vagina. Other mechanical obstacles might be mentioned of a nature susceptible of removal or improvement for the general purposes of delivery, but a sufficient number has been stated to illustrate my views of the subject.

Under the second division of mechanical obstacles to delivery, viz. that in which the opposition to delivery is absolute, may be comprised, first, all deformities of the pelvis reducing its dimensions below a certain size; or what would be equivalent to it, an enlargement of the head, rendering it so far disproportionate to the cavity of the pelvis as to require it to be lessened in size to allow it to pass; secondly, firm and unyielding tumours growing from the bony or soft structures of the pelvic cavity; thirdly, several of the preternatural presentations of the head and of the face, may with propriety be included under this arrangement; and this classification will be tolerated when our object is to illustrate a principle of practice, not directly relating to the management of such presentations.

The process of parturition, being usually well performed without artificial assistance, and rarely so well executed when assistance is interposed, it is evident that in the event of such interposition being contemplated, it should always be made an object of the most serious professional duty, to take a cautious and comprehensive survey of all the circumstances that can in any way influence or contribute towards the formation of a just prognosis.

It has been justly observed by Dr. D. D. Davis, of London, a late writer of eminence on operative midwifery, that "as an excuse, or a sort of salvo to easy consciences for an imperfect acquaintance with some of the more difficult and responsible duties of the art, it is become an almost proverbial remark, that dangerous cases of midwifery are but of extremely rare occurrence." It is indeed possible that a gentleman may practice many years in healthy and thin-settled districts without once meeting with a case requiring great professional skill, but such an individual must be regarded as peculiarly fortunate. Most professional men indicate a willingness to assist in cases of midwifery, and when they do, the interests of two lives are confided to their good management and protection, and the apology for deficient qualifications, resting on the supposed infrequency of difficulty or danger, will be received by an affectionate circle of friends as a very insufficient one for the loss of a valuable relative.

Until the introduction of the secale cornutum, the profession relied on the aid derived from instruments, in every case when delivery could not be accomplished by the efforts of the constitution. Since the employment of that article, it has been received by many without sufficient reserve, and has been regarded as possessed of properties calculated to supercede the use of instruments in the practice of midwifery. Its failure, in many cases not adapted to its mode of operation, and the dangerous effects to the fœtus in others, are not only calculated to bring it into discredit, but to prolong the use of instruments even in those cases, in which it can be employed with decided claims to superiority over them in every point of view.

It would extend this paper beyond the limits intended, were we to enumerate the various cases of difficult or dangerous parturition for the relief of which the advocates of instrumental delivery urge their employment; but in a great majority of cases in which they are used, the ergot is capable of accomplishing the end in view in a shorter time, with infinitely less risk or pain to the parties than accompanies the most dexterous employment of the forceps. Notwithstanding the danger that awaits the fœtus in every case in which the ergot is injudicious

ly employed, it does not endanger the safety of the mother, as I have not heard of a single case where its effects induced the least inconvenience to the patient or injury to the parts concerned. The most experienced operator with instruments cannot, consistently with truth, go so far in favour of the forceps or any other mechanical implement of delivery.

One of the late writers on operative midwifery in England, Dr. D. D. Davis, of London, has made the following remarks on the ergot. "If the ergot of rye, or any thing else which might be safely administered to a woman in labour through the medium of the stomach, could be really proved to possess in any considerable degree, a parturient influence on the uterus, it is obvious that it would form a most important addition to our materia medica, as it could not fail, in a certain class and proportion of cases, to supersede the use of mechanical instruments in the practice of midwifery." "The pretensions, however, of the secale cornutum have been generally known to the profession for a period of nearly twenty years, and yet the actual fact of its power has not been satisfactorily established; nor is there any evidence that I am acquainted with, that it has in one instance superceded the necessity of using the forceps."

It happens, however, that in the United States there no longer exists a doubt as to the "actual fact" of its possessing those properties, and of its having been subservient to the most important purposes in facilitating delivery, without instrumental assistance; as well as fulfilling equally important indications in the management of abortions, the delivery of the placenta, and other states of the uterus after delivery of the fœtus, that cannot be attained by other remedies or methods of treatment.

The ergot may be regarded as safe in all those cases in which there is deficient action of the uterus to accomplish delivery, whether the deficiency existed from the commencement of labour, or is the effect of exhaustion or of suspended action from other causes; provided the presentation be natural, and the head descended so far into the cavity of the pelvis as to occupy the concavity of the sacrum, and susceptible of motion upon moderate pressure made to move it, the os tincæ soft and sufficiently dilated to admit the passage of the head; the re-

maining soft parts through which the fœtus must pass, in a relaxed and yielding condition, and the bowels and bladder evacuated.

Cases of this description, every practitioner is prepared to admit are of frequent occurrence, and success from the exhibition of ergot in them, may be anticipated with as much certainty as in the use of other articles of the materia medica.

It constitutes no inconsiderable additional recommendation to it as a parturient remedy, that no other skill is requisite to its use, than to determine the precise combination of circumstances in which it may be administered without endangering the fœtus; as I again repeat, it never has, in my hands, after sixteen or eighteen years experience of its efficacy, endangered the safety of the patient or retarded her recovery. With those precautions it at once places the young upon a level with the most experienced practitioner. Not so in operative midwifery, where considerable experience is requisite to acquire the safe application of instruments; and even in the hands of the most expert and dexterous operator, they often inflict on the soft parts lasting injuries, besides the pain and terror excited by their application.

Besides the power of the ergot in establishing uterine contraction sufficient to accomplish delivery, other most valuable effects are derived from it; as it rarely fails to continue uterine contraction after delivery of the fœtus, by which the placenta is detached and expelled, thereby preventing those apprehensions for the safety of the patient, which are so often well founded. I have repeatedly given a small dose, a few minutes before the delivery of the fœtus, to guard against irregular and deficient uterine contractions, thereby preventing hemorrhage and the formation of coagula, and protecting the patient from the distressing effects of "after pains."

Extraordinary distension of the uterus, when there is a plurality of children, or excessive accumulation of the liquor amnii, predisposes to imperfect contraction, and excites just apprehensions lest danger may attend the delivery of the placenta. In such cases, especially the latter, it can be used with advantage, if administered in doses sufficient to invigorate and strengthen the pains of labour, and abridges the duration of the process without hazard to the parties.

I will state one case out of many that have occurred to me of this kind. Mrs. K. a large corpulent woman, sent for me at 3 o'clock on the morning of the 21st October, 1827; on my arrival I found she was in labour. The abdomen was enormously distended, and she complained of great incapacity to move about. Upon enquiry I learned her bowels had been freely opened the previous evening by castor oil, her pulse was natural, and other indications for successful delivery were favourable.

Upon examination, I found the os tincæ high up in the cavity of the pelvis, soft and considerably dilated, with the head of the fœtus resting on the superior strait of the pelvis. She informed me her labour had commenced in the early part of the night, but the pains were short, feeble, and recurred at long intervals. Her pains were so feeble and inefficient as to produce no perceptible effect on the os tincæ. As she was lying on the left side, I desired her position to be changed to that of the back, with the shoulders to be elevated. This change increased the frequency of the pains, gave them more effect, and rendered tense the bag of waters pressing through the os tincæ.

In a few minutes after this change of situation, when making an examination during a pain to ascertain the progress of her labour, and sustaining at the same time with one hand the abdomen which hung over the symphysis pubis in a remarkable manner, the membranes gave way, and a flood of water gushed from the uterus in larger quantity than I had ever observed on any previous occasion.

The relief experienced from the discharge of such an enormous quantity of water was so signal, that she imagined the child had passed the moment the membranes gave way, and the remarkable diminution of the abdomen authorised the same conclusion with all those who observed the contrast.

She remained in this situation, expressing herself perfectly easy and exempt from the distressing sensations resulting from the great uterine distension, for three quarters of an hour: the head of the child had in the mean time descended into the cavity of the pelvis: and as there was no prospect of a return

of "labour pains," I gave her ten grains of the powdered ergot infused in an ounce of water.

Five minutes, by my watch, after she had taken it, she complained of pain, and in thirty minutes from its exhibition, she was delivered of a small healthy child: the placenta &c. followed in due time. She had a rapid and unbroken recovery; and at this time enjoys better health than usual.

It is well known that frequent childbearing exerts a debilitating influence on the uterus, and not unfrequently on the whole system: in such cases the danger to be apprehended, arises from the failure of the uterus to contract and cast off the placenta and expel it from the uterine cavity. In these cases the judicious use of ergot, will not only rescue the patient from this danger, but save her a great deal of suffering that would otherwise follow from the irregular contractions of the uterus.

In several cases of this kind, I have witnessed the good effects of this medicine in exciting contraction, in so signal and efficacious a manner as to strike all those who observed its powers with astonishment.

In one case a midwife had managed the labour, with the patient resting on the lap of an assistant. After the birth of the child, as is too often practised, she attempted to bring down the placenta, by using extractive force applied to the cord; her efforts however were unsuccessful, and a bold hemorrhage was the consequence of her indiscretion, which was soon followed by syncope.

In this situation I was sent for in haste. Upon my arrival a few minutes after, the woman was without pulse at the wrist, pale, and breathing with great difficulty and at long intervals. Upon applying my hand to her abdomen and pressing over the uterus, it appeared flaccid and remaining high up in the abdominal cavity.

I ordered her to have whiskey and water mixed in equal quantities, by the table-spoonful, as often as she could swallow it, and made pressure on the abdomen to excite uterine contraction. Large coagula of blood followed the first pressure of the hand without any appearance of contraction.

I then made an examination per vaginam, and found the placenta partially adherent; and being unwilling to risk its

detachment by passing up the hand and separating the portion attached to the uterus, I gave her a dose of the secale cornutum, and continued the administration of the spirits and water, and pressure over the uterus.

She remained in this critical situation for thirty or forty minutes, according to the best computation of the time I could make, with occasional discharges of fluid and coagulated blood, when she faintly expressed herself in pain. A short time after the pain became continued and the uterus began to feel hard and globular, the uterine contraction increased, and with its increase it sunk lower in the cavity of the abdomen. About this time the pulse was again perceptible at the wrist and the breathing improved. An examination was now made, and I had the satisfaction to meet with the greater part of the placenta lodged in the vagina, and it was removed in a short time without difficulty, followed by large coagula of blood.

The pain now ceased, and the symptoms not appearing to demand a continuance of the stimulants, she was suffered to remain quiet, with a continuance of gentle and uniform pressure by a bandage passed around the abdomen.

Her recovery from this state of prostration and danger was gradual for the first thirty-six hours; after that time it became more steady and rapid. At the expiration of a month, she was enabled to resume the duties of a cook to a large family.

In another case, in its most material point of view similar to the one above recited, the patient, a delicate woman, had been delivered of her second child, upon the lap of an assistant. The moment after the delivery of the child, the midwife directed her to stand on her feet, and in that position extracted the placenta by pulling at the cord; she was then "put to bed."

It was soon discovered that she grew faint and sick at the stomach, with a change in her respiration; the friends took the alarm at those symptoms and I was sent for. On my arrival I found the uterus high up in the abdomen, soft and distended.

Apprehending internal hemorrhage, fifteen grains of ergot were given her, infused in about an ounce of hot water, followed by occasional portions of brandy and water. In a short time

the contractions of the organ were excited, as evinced by its increasing hardness and descent, together with the escape from the vagina of large coagula of blood. She gradually recovered from the faintness, the sickness at stomach wore off, and the uterus passed into the lower part of the abdomen, when the hemorrhage subsided.

This lady lingered and was exceedingly prostrated for the first two or three days; after that time, she rapidly regained her usual health.

In labours complicated with uterine hemorrhage, syncope or convulsions, the ergot may be given with the prospect of abridging the sufferings of the patient. A midwife of the neighbourhood sent for me to visit a respectable farmer's wife in labour. On my arrival about 5 o'clock in the morning, she informed me that she had been in attendance for the two previous nights, that before she was sent for the woman had been attacked with flooding, which had continued at intervals up to the moment of my arrival, but was not excessive. The patient was very languid and faint, with a weak fluttering pulse.

Upon examination, I found the os tincæ considerably dilated and soft, and the right hand of the fœtus lying in the vagina, with a large coagulum of blood. The patient had been exempt from labour-pains for the greater part of the preceding night, and whenever they occurred, during the preceding day, the hemorrhage was increased.

She was directed to be placed in a favourable position for delivery. Whilst her friends were changing her position, there was a considerable discharge of blood, with a strong tendency to syncope. As the pains had entirely subsided, and the uterus was quite relaxed, I apprehended defective contraction; and to guard against further loss of blood, when the placenta should be separated, I concluded to give her a small dose of the ergot. Accordingly, five grains were prepared as before stated, and immediately given, with a determination to repeat that quantity at intervals of twenty minutes, until it revived the uterine contraction.

The relaxation of the os tincæ and cervix uteri was such as to leave no doubt that the hand could be passed into the ute-

rus to possess the feet and thus prepare for delivery. A few minutes after taking the second dose, she complained of uneasiness and pain in the region of the uterus; and as I had determined to seize upon that moment, as the proper time to introduce my hand and bring down the feet into the vagina, it was accomplished without difficulty.

The labour was then suffered to progress, with the usual precautions, and terminated without any material deviation from similar presentations, without further hemorrhage.

In natural presentations complicated with uterine hemorrhage, where the loss of blood has so weakened the patient that she is unable to expel the child, the use of the ergot is certainly to be preferred to the painful and unpleasant operation of turning and delivering by the feet, or to the use of the forceps; and even if the latter should be decided on as most safe, the ergot in small doses will add to the safety of the patient, by causing the uterus to act on its contents in a way favourable to the wishes of the practitioner.

In most cases of syncope complicated with labour, it is induced by hemorrhage. When it appears to arise from other causes, it does not forbid the use of the ergot, as a means of keeping up the parturient powers, and unless contraindicated its aid may be valuable.

Convulsions, when they are associated with labour, generally require the bold and decided use of the lancet to allay their violent and alarming symptoms, before the accoucheur can with propriety attempt delivery; and although the uterus is passive during their continuance, yet if the interval should allow a dose of ergot to take effect, it will establish the active efforts of that organ and supercede the tendency to convulsions.

With other appropriate remedies, it may be esteemed a valuable medicine in these frightful cases, but candour obliges me to state that my trials of it in this kind of labour, will not permit me to express any decided opinion of its advantages over other known methods of treatment.

In the management of abortion and premature labour, where loss of blood is not necessary to the completion of the process, and irregular spasmodic actions of the uterus are so common,

constituting the principal source of alarm and danger, a judicious and well timed administration of the ergot will afford relief.

In those cases in which the ergot has been given during labour, for the accomplishment of the several indications above recited, I have generally remarked, that there was much less of the lochial discharge than usual after delivery, without any inconvenience resulting from its quantity being diminished; and I have farther observed, that prolapsus uteri was an uncommon occurrence after such labours.

I have been disposed to attribute the diminished lochial discharge, and the exemption from prolapsus uteri, to the efficient contractions established in the uterus, by which it returns more speedily and perfectly to its primitive size.

The weight of the uterus being much greater, for some time after delivery, than in its unimpregnated state, together with the relaxed and distended condition of its attachments, renders the practice of too early rising after delivery, exercise, and long standing, fruitful causes of uterine displacement. It would, therefore, be a fair inference, that whatever course of treatment would enable the organs of generation to resume their condition previous to impregnation, should be regarded as favourable to their healthy action and influence on the general system.

The ergot does not excite the uterus to a more vigorous exertion of its usual successive efforts, but manifestly induces a regular and continued contraction, which, unless opposed by a stronger countervailing influence, will eventuate in the expulsion of its contents.

This being the mode of action excited by the ergot, it is easy to perceive the danger that would await the fœtus if long detained in the uterine cavity, after those strong and ceaseless contractions are established, especially if the head closely fill the pelvis.

It may be said in objection to this hypothesis, for I will not call the suggestion by any other name, how does it happen, that the head of the fœtus may be lodged in the bones of the pelvis for days, and there made to assume the shape and dimensions of that cavity without destroying its vitality?

When the peculiar character of uterine contraction induced by the ergot, is contrasted with the natural efforts of the uterus uninfluenced by this or any other artificial excitant, the cause of danger from the one becomes manifest, and the comparative exemption from it in the other is susceptible of explanation.

The expulsion is accomplished in natural labour, essentially by the collateral organs, the uterus simply adapting itself to its contents, at the same time unfolding its orifice in a way favourable to the exit of the fœtus from the cavity; and this adaptation is not so rigid and unyielding as to interrupt fœtal circulation; and whenever the head has to be altered in shape, or diminished in size, in one or more directions, it is accomplished by successive efforts of the parturient pains, gradually and not hastily or with violence.

Whenever the pain ceases, the adaptation of the uterus to the fœtus is such as not only to allow the head to recede gently, but what is of far more importance to the preservation of its life, the blood circulates freely. In this way, under judicious management, a labour may consume several days; the greater part of the time the head will be passing the straits of the pelvis, and the life of the child preserved, notwithstanding the head may be frightfully altered in its shape.

In those cases, every part of the passage is made by reiterated efforts, and those efforts surpassing the degree of difficulty and resistance to be encountered.

When delay and difficulty result from obstacles of a mechanical nature, their removal must precede the use of the ergot, or the danger to the life of the fœtus will be proportionate to the amount of mechanical impediment and consequent delay.

Without intending to speak definitively on the subject, I will suggest that danger of this kind may be anticipated when the labour lasts beyond one hour after the ergot has taken effect. In first labours therefore, it should rarely if ever be administered; or where the adaptation of the head to the pelvic cavity is close and requires alteration in its shape to allow it to pass, time must be given the efforts of the system to accomplish

this desirable and necessary preparation, or danger will be the consequence.

On those occasions, the patient ever ready to distrust her own powers, will often make appeals to her attendant for assistance, and if he should mistake the apparent inefficiency of her pains and conclude that more power is necessary, and use the secale cornutum for that purpose, the life of the fœtus will not only be lost, but he will discover it is not adapted to his purpose; as it argues a want of knowledge of the function to suppose that a given power is adequate to delivery in every case.

Since the introduction of this article into practice, there is reason to apprehend it has been too often substituted for the invaluable effects of blood-letting. There is however no analogy between them in their mode of operation. Unrivalled success attends blood-letting in taking off the resistance produced by rigidity of the os uteri and other soft structures through which the fœtus has to pass, as well as invigorating and strengthening the parturient efforts, while the whole effect of the ergot is to increase the contractions of the uterus.

There are other forms of labour, besides those above mentioned, that allow of the efficacious administration of the ergot, wherein the aid of instruments is exclusively relied on; but I forbear to express myself on the subject, as they are surrounded by so many contingent and varying circumstances as to forbid the unqualified recommendation of a remedy, that has already given rise to the apprehension that its employment has been too indiscriminate.

Note.—It is not necessary to add any thing in confirmation of the principles advanced in the preceding paper; but it may not be improper to state a case in confirmation of Professor Richardson's opinion of the value of ergot in puerperal convulsions.

A stout young woman, half-witted, having become pregnant, about the time she was expected to be in labour was violently convulsed. The convulsions continued for a whole day, when she was so exhausted that little force was required to restrain her.

In this situation, being called to see her, I found the os uteri somewhat dilated and relaxed, and was informed that no progress had been made in the labour for many hours—The convulsions still continued, but there was no appearance of uterine effort. It was evident that she was so exhausted that she could not be delivered without aid, and I immediately determined to give her the ergot. This was her first pregnancy. Half a drachm of the medicine was boiled a few minutes in water, and the decoction given her with some difficulty as she lay in a stupor. In a very few minutes afterwards, the uterine efforts commenced with great vigour and she was very soon delivered of a dead child. She recovered, I was informed, as speedily as usual. C.

ART. III.—*An Essay on Cholera Infantum.* By JOHN ESTES COOKE, M. D. Professor of the Theory and Practice of Medicine in Transylvania University.

IT is proposed in the following essay to give a brief view of the pathology and treatment of cholera infantum. Correct pathology is necessary to successful practice; and although many valuable papers have been written on this subject, it is thought that medical writers have too easily admitted a variety of agents as remote causes of this disease, and have not sufficiently turned their attention to that one which alone is the cause of its prevalence as an epidemic. This disease moreover is so extensively prevalent in the South and West, that it is a subject of prime importance, particularly to young practitioners just entering upon the theatre of life, to have a clear conception of the remote cause chiefly operating, the internal derangement thereby produced, and the most effectual means of removing it and the symptoms arising out of it. To these three points the attention of the reader is particularly invited.

This disease has been attributed to teething, to eating fruit, to worms, to cold, and to heat.

That the process of dentition cannot be the cause of this epidemic is evident from the following considerations. 1, Children are teething throughout the year, while cholera is almost entirely confined to one part of it; 2, Many have it in the season for its appearance who are not teething; some before the process commences, others after it is over. This process is however very irritating, and no doubt contributes, when conjoined with the principal cause hereafter to be mentioned, to increase the fever present in this disease.

Eating freely of the fruits which abound in summer, has no better claim to be considered the cause of this epidemic. Cholera infantum is more fatal in cities where fruit is comparatively scarce, than in the country where children eat as much as they please. In a family in which I practised for a number of years, the successive children were all affected with cholera, notwithstanding that there was the utmost pains taken to keep them from fruit. On the contrary, my own family has suffered very little from this disease, although the children have been allowed to eat as much fruit as they pleased. For some years we occupied a house, the garden of which was an acre of ground containing a great variety of fruits in abundance, to which five small children, white and black, had every year free access, and commenced on the currants, gooseberries, plumbs, &c. before they were ripe.

Fruit and other articles of diet, frequently of the most simple and nutritious kind, such as are totally incapable of producing disease, and such as the child has in numberless instances used with the greatest advantage, are often charged with producing cholera. But when acidity and vomiting or purging take place after eating such things, it is an evidence of the derangement of the stomach previously subsisting. It is in this case as in dyspepsia; eating some acescent article of diet is often charged with producing the disease, whereas the acidity and eructation are the consequence of a morbid condition of the stomach, without which the food would have been digested as formerly.

It is not intended to say that some fruits have not a laxative operation on the bowels of children: but this, when produced, is no more the cholera, than a like operation produced by magnesia. In both cases, if the child be at the time in health, no other symptoms of cholera are produced than the disturbance of the bowels, and perhaps of the stomach: the internal derangement, the effect of the remote cause, out of which the symptoms spring, does not here exist. If the child be at the time under the influence of the remote cause of cholera and of the internal derangement resulting from it, fermentation is apt to take place in a mass of acescent food, because the stomach is disordered; but in consequence of this disorder not appearing until after the food is taken in, the latter is erroneously supposed to be the cause of the disease.

Cholera has likewise been attributed to worms. In many cases however it is certain that none of these exist in the bowels; and in others in which they were present, the disease has continued after they have been expelled. There is another reason however, which operates with equal force against the pretensions of all agents which are present at every period of the year. The disease is epidemic in one season only and therefore must be the effect of some cause then arising.

Cold has no better pretensions to be considered the cause of this epidemic, which is especially a disease of hot weather. Cold may even be managed so as to benefit a patient in cholera. In certain circumstances it increases the symptoms by co-operating with the principal cause in increasing that internal derangement from which they spring; but cold alone never produces such an epidemic.

Excessive heat has also been considered as the remote cause of cholera. But although it is unquestionably true that hot weather is the season in which it is epidemic, it is to be observed that this disease is not always most prevalent in the hottest summers. The summer of 1821 was, in the upper part of Fauquier county in Virginia, after July uncommonly hot and dry, insomuch that the grass and even the indian corn was burnt up; it was nevertheless uncommonly healthy. The same occurred in Minorca in the year 1749. The drought according to Cleg-

horn was so great that the harvest failed; in some parts "they scarcely reaped as much corn as they had sown." At the same time it was excessively hot in June, and "the weather there had seldom been felt so excessively hot and sultry as this year in July; the quicksilver rising daily above the 80th degree of the thermometer, and never falling below the 79th, even in the night-time, till the rains which fell in the latter part of the month had cooled the air."[1] The medium height of the mercury in the thermometer was in July of this year, about one degree and a half greater than it had been in the six summers Cleghorn spent in the island. But notwithstanding this excessive heat, he says "in June and July there were some specimens of the summer diseases, but so few that they scarcely deserve to be called epidemical;"[2] while in the preceding summers, one of which was not as hot as usual, the cholera was very fatal.

There is evidently therefore something more than heat necessary to the production of this disease. What this is may readily be discovered by attending to the circumstances in which the disease appears in different situations.

With this view let us minutely examine the state of the weather in the different years that Cleghorn passed in the island of Minorca. I know no work which contains so exact an account of the weather and diseases for so many years in succession, as the valuable work of that writer on the diseases of that island.

The following table represents the state of the weather and the diseases in each year from 1744 to 1749 inclusive. The quantity of moisture in the first four months is stated separately from that in the second four, because the latter has more effect on the epidemics of the year than the former, in consequence of falling in the warm weather. The figures and fractions, under the head of temperature represent the medium heat of the weather during the months of June and July.

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1 Cleghorn's Obs. on the Dis. of Minorca, p. 117. 2 Ibid. p. 134.

	Moisture. In the 1st 4 months	*Do.* In the 2d 4 months	*Temperature.*	*Diseases.*
1744	Much rain till the middle of April.	very dry	July not as hot as usual. August very hot and sultry.	Cholera began in the end of June. Tertians numerous in July, but not so universal or malignant in Aug. and Sept. as they commonly are. Dysentery began after middle of Sept. and was general and malignant
1745	18 days of rain 5 of heavy rain 1 of floods of rain.	13 days of rain 1 of heavy rain 6 of floods of rain.	hot and sultry. August excessively so 75 14-31	"June was scarce ended when the *tertian fevers and cholera morbus* began and increasing daily according to custom, came to their greatest degree of frequency in Sept. from which they gradually declined," &c.
1746	24 days of rain 5 of heavy rain 5 of floods of rain.	13 days of rain 5 of floods of rain.	hot till the middle of Sept. but afterwards very cool 77 3-31	"The chincough had no sooner disappeared than a *periodical fever accompanied with vomiting and purging* took its place, which proved alike fatal to many children during the summer." In July the tertian fevers broke out as usual, and their violence being augmented by the excessive heat of the season many persons died &c. the cool weather in Sept. prevented their becoming so general or continuing so long as common.
1747	23 days of rain 10 of heavy rain 1 of floods of rain.	18 days of rain 3 of heavy rain 6 of floods of rain.	extremely hot from May till the middle of Sept. 77 19-31	"The extraordinary heat of May ushered in the *summer diseases* somewhat sooner than usual. For about the end of that month, the cholera morbus carried off many children and in June the tertians became universal. Besides towards the end of June the diarrhœa dysentery and tenesmus broke out and raged violently for some weeks."

	Moisture. First four months.	*Do.* 2nd four months.	*Temperature.*	*Diseases.*
1748	40 days of rain 15 of heavy rain 2 of floods of rain.	11 days of rain 1 of heavy rain 3 of floods of rain.	extremely hot & sultry in July. 77 16-31	The summer proved very unhealthy to the children, many of them dying of cholera morbus and periodical fever, &c. The tertians began in July and finished about the end of November. Dysenteries prevailed in Ciudadella.
1749	14 days of rain 5 of heavy rain 2 of floods of rain	May, June & July. 10 days rain 4 heavy rain 3 of floods of rain.	June dry & extremely hot. July seldom so extremely hot and sultry. 78 12-31	Cleghorn left Minorca early in August. "In June and July there were some specimens of the summer diseases, but so few that they scarcely deserve to be called epidemical."

Great drought; short harvest.

These statements from Cleghorn show in the clearest manner, what was before admitted, that heat is essential to the prevalence of cholera as an epidemic. Thus, it does not commence until the hot weather of June and July in general; and when the weather is unusually hot earlier in the year, it makes its appearance earlier, as in the hot month of May 1747.

But it likewise shows that heat, though a circumstance essential to the prevalence of this epidemic, and therefore to the existence of the cause of it, is not itself the cause. It will be observed that the medium heat of June and July in the years 1746, 1747 and 1748 is almost the same, the highest and lowest varying only half a degree, and that of 1749 is nearly a degree higher than the highest of them; yet we find that the latter was much the healthiest of all these years. It was even much more healthy than the year 1745, in which year the medium temperature of the two months June and July, was very nearly three degrees lower than in 1749.

The same statements show also what additional circumstance is necessary to the production of this epidemic. The different years mentioned differ not so much in heat as in moisture. Though the former differs but little, there is a great difference in the latter; and on comparing the different summers together, we find that the wettest were the most sickly. Thus, 1748 was somewhat cooler than 1749, but much wetter and much more sickly; and 1745 considerably cooler, but much wetter than 1749, was likewise much more sickly. Furthermore when we compare those years that were both hot and wet, we find the cholera in proportion to both: thus the year 1745 was hot and wet, and sickly, but the three following years were hotter and wetter and more sickly in proportion.

From these facts it is evident that cholera infantum depends on some cause arising out of this combination of heat and moisture; and when this is considered in connexion with the additional facts which appear on the face of the above statement, viz. that cholera and tertians prevail together in every year; that when one appears earlier, the other does also; both in consequence of the earlier appearance of that combination of heat and moisture which produces them both, as in 1747; and lastly that when there is a considerable deficiency of moisture, neither tertians nor cholera are very prevalent, notwithstanding the heat of the weather is extreme, as in 1749, it is very evident that they both depend on the same remote cause arising out of this combination of heat and moisture; viz. on miasmata.

The opinion that heat alone is the cause of cholera has perhaps derived its chief support from the authority of Rush, who says "Its frequency and danger are always in proportion to the heat of the weather." We have however shown from the best authority, for such Cleghorn certainly is, that the frequency and danger of this disease are not always in proportion to the heat of the weather. This observation of Rush's is the result of his experience in Philadelphia; and it is conceded that in that city the rule holds good. It is to be observed however, that the very same is true respecting the prevalence of the autumnal fever in that city; it having been ascertained, from observation of the thermometer during twenty-five sum-

mers, that in that city the "grade and frequency" of autumnal fever is always in proportion to the same circumstance, the heat of the weather. It has however been ascertained from a multitude of observations in all parts of the world, that autumnal fever is not caused by heat alone, but by miasmata proceeding from vegetable matter undergoing decomposition; and the reason of these diseases seeming in Philadelphia to depend on the grade of heat alone is that there is a large body of marsh near it, from which, whenever the temperature of the atmosphere is high enough, miasmata in abundance are evolved. This dependance of the two diseases on the same state of the weather in Philadelphia tends directly to the same conclusion, that cholera and autumnal fever are produced by the same remote cause, miasmata. A variety of considerations confirm this conclusion.

The cities of the South are more subject to the ravages of cholera infantum than those of the North, as they likewise are to autumnal fevers. Those cities, which, from their low and marshy situation, are remarkably subject to fevers, are also to cholera. In cities, those parts most favourable to the production of fevers, such as narrow dirty alleys, and filthy suburbs in the neighbourhood of marshy inlets, brick yards, standing water produced by regulating streets, &c. are also most productive of cholera infantum. If a city by draining, cleaning, &c. be preserved from the former disease, it is likewise freed from the latter. The town of Winchester in Virginia, is situated on a level spot which was originally marshy, and still has a stream of water running through it. In process of time the marshy grounds have been filled up with earth, the bed of the stream has been made deeper and wider, so as to carry off a much greater quantity of water than it formerly did, and the whole town has become drier and cleaner. In consequence of this change, the town has become much more healthy. I have been informed by several females who have raised families there, that some years ago great numbers of children died with bowel complaints. Of late years however comparatively few cases of this disease occur. In one quarter however, in consequence of some regulations of the streets, a

pond was made; and a considerable number of cases of fever and of cholera infantum occurred in the immediate neighbourhood of the pond. It was filled up with clay, and there has been little or none of either since that time, in that quarter.

This disease appears also in the country in places favourable to the production of autumnal fever; as about mill ponds, near water courses, marshes, and low grounds. Country air is recommended by city physicians in this disease; and it is an advantage to children, if the air of the place to which they are carried is purer than that of the city. But if the place of retreat be near marshes, the infants are not benefited by the change. Dr. Rush tells us that of the only three patients he ever lost, of those who were sent into the country, two had been carried into the impure air of the marshy neck below Philadelphia.

In cities in which autumnal fevers annually prevail, children are in such danger from cholera, that great numbers are carried into the country, to spend in a pure air the time during which the autumnal fever prevails; and they cannot be taken back with safety until that time be past. If they return during that period, they are in danger of an attack of cholera, or of a relapse, just as those adults who return prematurely are from an attack of fever.

We have seen from Cleghorn's statements that in the island of Minorca, cholera and tertians appear together in the same situation and circumstances of weather; that which produces, hastens, or delays the one, producing, hastening, or delaying the other. It appears further from the representations of the physicians of Philadelphia, that the variations in the weather produce the same effect on the grade of the two diseases. Dr. Rush, in his inquiry into the cause and cure of this disease states "that since the prevalence of the yellow fever in Philadelphia after the year 1793, the cholera infantum has assumed symptoms of such malignity as to require bleeding to cure it. In some cases two or three bleedings are necessary for that purpose." It will be remembered that for about ten years after 1793, the autumnal fever was also more malignant than it had been for a long time in Philadelphia, in consequence

of the great heat of the summers of those years. Dr. Jackson, in his account of the malignant or yellow fever of 1820 in the same city, says "In the past summer and autumn diseases assumed the general symptoms which they possessed in the former epidemic period of 1793, 1797, and 1798. Cholera morbus and infantum were very prevalent; bilious and remittent fevers from which our city had been for several years nearly exempted, were common diseases; and dysentery, which had become a rare disease in Philadelphia, was of frequent occurrence, and very difficult to manage."[3]

It has been objected that the same cause cannot produce both cholera and autumnal fever, because the former appears somewhat earlier in the season than the latter.

It may be observed in reply, that the tendency of the *argument*, founded on the appearance of the fever and cholera in the same situations and in the same kind of weather, is to show, that both depend on a common cause arising out of those circumstances; and that the force of *the objection* rests on the presumption, that, as the fever appears later than the cholera, the cause of the fever could not have existed when the cholera commenced, or it would likewise have produced the fever. The truth however is, that miasmata, the cause arising out of the circumstances above mentioned, are produced before either autumnal fever or cholera become epidemic. The first warm weather produces an evolution of gas from moist and filthy spots. It is stated by Dr. Jackson, in his account of the fever of 1820 in Philadelphia, that bubbles of air were seen constantly disengaging from the half-fluid mud in some of the confined alleys of that city as early as in May. I have myself seen the same even earlier in the season. The *argument* therefore is sustained, and the force of *the objection* falls before the fact, that the cause of autumnal fever exists before the appearance of cholera infantum; while the dependance of both on the same cause, miasmata, is shown by the correspondence of both, in the number of cases and in grade, with

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3 Phil. Jour. of Med. and Phys. Sci. 2. 319.

the increasing power of that cause, as the season advances, or when it is hotter, or when it comes earlier than usual.

The correctness of this view of the subject is further shown by the occurrence of autumnal fever in some children, precisely such as also occurs later in the summer, at the same time that others have cholera, showing manifestly at the earlier period the presence and the operation of miasmata.

We inquire next into the nature of the internal derangement produced by this remote cause.

The cause of this epidemic being the same with that which produces autumnal fever, the operation on the system must be the same, and the internal derangement the same. This we have shown in a previous paper[4] to be an accumulation of blood in the vena cava and its great branches; and that it exists in cholera infantum is evident from the symptoms observed in the disease.

It is strongly indicated by the pale and bloodless appearance of the little patient, as well as by the shrunk state of the surface generally, particularly observable in the hollowness of the eyes. It is manifestly the cold stage of the disease, and although there is not often a chill observed, yet it is sometimes manifest. The following passage is taken from my note-book. "This fall (1821) our bilious fevers have almost all been intermittent; and I have distinctly observed in the children in cholera, a stretching accompanied with coldness, which may well be called a chill."

This state is also evinced by the fact that this disease is almost universally accompanied by fever. We indeed often find the patient cool and pale; but there is notwithstanding, a regular evening exacerbation. Dr. Rush on the subject of cholera says "It sometimes begins with a diarrhœa, which continues for several days without any other symptom of indisposition; but it more frequently comes on with a violent vomiting and purging, and *a high fever.*" "The fever is of the remitting kind, and discovers evident exacerbations, especially in the evenings." Cleghorn's testimony is of the same import.

4 Transylvania Journal of Medicine, vol. 1, p. 60,

He says "Towards the end of June the young children are attacked with a vomiting and purging and *periodical fever*, &c" [5] "The chin-cough had no sooner disappeared than a periodical fever accompanied with vomiting and purging took its place," &c.[6] Fever being therefore almost universally present in cholera, and every fever being preceded by a cold stage in which the blood retires from the surface and consequently accumulates in the interior veins, this state of accumulation in the interior veins exists in cholera.

The same accumulation is evinced also by the presence of its known effects on the head, stomach, and liver.

The head is always more or less affected; stupor or disposition to sleep is common; pain in the head, frequent; convulsions, and apoplectic symptoms not uncommon.

The secretion of the liver is disordered: that gland is often sensibly enlarged; there is sometimes an excessive flow of bile from it; at other times there is such an engorgement of the veins constituting the liver, that secretion is suspended, and the discharges from the bowels, when they are somewhat consistent, are whitish or what is called clay-coloured.

The disordered state of the stomach is likewise the effect of the same accumulation, as will appear from the following considerations.

From the able experiments of that great physiologist, Spallanzani, it appears that when the common articles of food are immersed in gastric juice no fermentation takes place, care being taken to preserve the vessel in which the experiment is made in a proper degree of heat;[7] and that this fluid even corrects putrefaction when it has commenced in meat, &c. [8] When however, instead of the gastric juice, saliva or water was used to moisten and cover the mass, the experiment in every other respect being conducted precisely in the same way, "the mixtures began, some sooner and others later, to emit air-bubbles, which soon increased in frequency and size; the surface of the liquor was covered with froth, which continued as long as any air was generated. During this time

5 Cleghorn's Obs. on the Dis. of Minorca, p. 121.
6 Ibid. p. 129.
7 Spallanzani's Dissertations, vol. 1, cexxxvi.
8 Ibid. ccivi, &c.

the mass swelled greatly, the intestine commotion was manifest, and the substances immersed being made specifically lighter by the air-bubbles that adhered to them and the increase of bulk, rose to the surface of the fluid."[9]

The conclusion is, that the gastric juice is that which restrains the disposition to fermentation, natural to the usual articles of diet in the situation in which they are placed, as to heat and moisture, in the stomach; and that when every mark of fermentation which took place in the experiment of Spallanzani, abovementioned, appears in the stomach, they must proceed, as in that experiment, from the absence of the gastric juice.

The deficiency of gastric juice in this case is the consequence of the interruption of the functions of the glands which secrete that fluid, by the same engorgement of the vessels constituting them, that interferes at the same time with the secretion of bile. The accumulation of blood in the veins of the liver, cannot fail to extend to those of the stomach which pour their blood into them; and when therefore the functions of the former are interrupted, those of the latter ought also to be.

The vomiting and purging result from the action of the fermented mass on the stomach and bowels, as well as from the increased sensibility and irritability of the alimentary canal, proceeding from the same accumulation in all the interior veins and small arteries entering into them. We know of no case in which the presence of an increased quantity of blood in the small vessels of a part does not render it more sensible to impressions.

The accumulation of blood in the interior is the cause of another symptom in this disease, viz. the tumid state of the abdomen, notwithstanding the great discharges from it.

These discharges themselves are another effect of the same cause. The load of blood in the liver and in all the viscera, producing an obstruction to the free entry of that fluid from the minute arteries into the corresponding veins, there is a great press upon every point by which a part of their content

9 Ibid. ccxxxiv.

may pass: those minute vessels therefore which carry off a transparent fluid to lubricate the internal surface of the stomach and bowels, not being obstructed by any thing in their course, now pour an increased quantity of serous fluid into the alimentary canal, which is ejected from them upwards or downwards according to circumstances.

We have now considered the subject of the remote cause which produces this epidemic, the internal derangement resulting from its operation, and the symptoms arising out of it. We have seen that the remote cause is the same with that which produces the autumnal fever, that the internal derangement is the same, and the symptoms, if attentively considered, will be found to be essentially the same.

Cases of both cholera and autumnal fever in children, occur at the same time, and there is in both, fever with evening exacerbations and morning remissions or intermissions.

In both, the head is affected with pain and stupor, and convulsions frequently occur.

There is in both a want of appetite, nausea, and griping.

In the autumnal or bilious fever, the nausea is occasionally attended by vomiting, and if a cathartic dose of calomel be given, the discharges from the bowels are green, dark, or black.

In cholera infantum the nausea increases until it terminates in vomiting or purging of bilious matter and of a thin fluid sometimes coloured by bile, sometimes without colour; and if a cathartic dose of calomel be given, the very same kind of passages are produced as in the other case.

Moreover under a continuance of the mercurial cathartic medicines, those cases which commence with vomiting and purging, even of a watery colourless fluid, lose their peculiar symptoms, and assume those of the cases which did not begin with either vomiting or purging; insomuch that no one on the second or third day could possibly, from the existing symptoms, distinguish them, or say which case commenced with vomiting or purging, and which did not.

The remote cause of cholera and autumnal fever being the same, and the internal derangement thereby produced being likewise the same, it follows that the same object should be

held in view in the treatment of both, viz. the reduction or removal of the accumulation of blood or congestion in the interior veins, from which spring all the symptoms observed. This is effected by means of discharges from the liver. The communication between the branches of the vena portæ, those of the venæ hepaticæ, and the biliary ducts, is so free, that if either of them be injected, the others will be filled. It is manifest therefore, that these ducts constitute an outlet from those veins, and consequently from the whole of the great interior veins; and that free and continued evacuations from the former will in the most direct manner lessen accumulation of blood in the latter.

In perfect accordance with this view of the subject it will be found, that the main dependance for a cure of this disease is on purging, so managed as to produce evacuations from the liver, and continued daily, as in autumnal fever, until health be restored. The same consistent bilious evacuations are necessary in both: how to effect them, is the whole difficulty in those cases in which there is extreme irritability of the stomach and bowels, and the difficulty is the same in both children and adults: cholera infantum is the same precisely with the cholera morbus of adults. The distinction implied in the word *infantum* is of late date. It is not used by Sydenham, Boerhaave, Cleghorn, or Cullen. Sydenham mentions children being affected by cholera morbus; Cleghorn does the same in very many passages. Boerhaave in his aphorisms, and Cullen in his First Lines, do not mention children at all in their account of cholera, whence it is evident that they intended to include the vomiting and purging of children under the general title of cholera morbus.

The recovery of the patient depending upon a free discharge from the bowels of dark-coloured, green, or yellow matter of soft consistence, if the passages be already of this description, they should be continued; and if small and griping, as they very often are, they should be rendered more free by a mercurial cathartic. Parents often attribute the weakness of the patient to the purging, but after a free operation, children feel much stronger.

In treating this disease we meet with the same difficulties that oppose us in treating the autumnal fever, and all the combinations of cathartics, necessary in the latter, are likewise necessary in the cholera. Calomel and rhubarb in equal quantities, often operate in the most desirable manner: if they do not act sufficiently, jalap or scammony may be tried instead of the rhubarb: if the passages produced by this compound be too thin and serous, a mixture of scammony or jalap, with rhubarb and calomel, may be used. Calcined magnesia is sometimes used to quicken the operation of calomel, but it is too apt to produce thin passages.

Five grains of calomel with the same quantity of either of the other medicines mentioned, is a suitable dose for children of eight or ten months. It will sometimes be found however that a number of such doses will be required in the day to operate freely; and in all cases, the physician after having decided correctly as to the object in view, ought to effect it.

The free consistent discharges being continued daily, they gradually approach to a natural state, in colour and smell, and when this takes place under the influence of mercurial cathartics, the child, perhaps invariably, shows every mark of returning health.

We have thus far, in speaking of the treatment of cholera, had in view those cases in which the discharges are still bilious, as they very often are in the commencement. The physician however often finds that they have become, or have from the beginning been thin, serous and profuse. The child sometimes commences with discharges of this kind from the stomach, sometimes from the bowels; and whether the one or the other be first affected, the other is soon disordered, and sometimes they are both so from the beginning.

In this case the object is the same, to procure as speedily as possible consistent discharges from the liver, and to continue them. Calomel is better adapted to the end in view than any known medicine; inasmuch as it is weighty and the dose small in bulk, and therefore cannot easily be rejected; and it is likewise least apt of all the cathartics to produce watery passages, and most effectual in producing consistent discharges

from the liver. Five grains of calomel every twelve hours, almost invariably effect the desired alteration in the passages in twenty-four, thirty-six, or forty-eight hours. This is so certain that, in critical circumstances arising out of difference of opinion with another practitioner, I have ventured to predict that under the treatment proposed, with calomel alone, the passages would in forty-eight hours become black; and the prediction was verified by the event, although there had been no other than serous, colourless passages for many weeks.

It sometimes happens that the calomel alone does not purge the patient: the thin discharges cease entirely, but no others appear. In this case it becomes necessary to add rhubarb, jalap, or scammony to the calomel. Five grains of one or other of these medicines with the same quantity of calomel is the best prescription in this state of things. Rhubarb is preferable, being more like calomel in its action than either of the others; but sometimes it does not operate, and we are driven to the use of some more active medicine. Scammony is preferable to jalap because it nauseates less and is more active.

As soon as consistent passages are established, the copious thin discharges cease: it frequently happens that not one is observed after the first consistent evacuation. After the passages become consistent and coloured, the treatment of the patient proceeds exactly in the same manner as if they had been so from the beginning; which case has been already considered.

The proportion of calomel may be diminished after the coloured evacuations appear. If the quantity taken to effect the change have been considerable, it is sometimes prudent to omit the calomel entirely: but, if the passages become thin and watery in consequence of the omission, it is necessary to return to the use of that medicine. There is some risk of ptyalism; but it is better to run the risk, than to let the child die. Ptyalism has never occurred but once in my practice in this disease: the case was an extremely severe one, and I fully believe would have terminated in death under less active treatment.

The above mentioned doses are of the proper size for children eight or ten or twelve months old. The youngest, even those of one or two weeks, take two or three grains of calomel

with or without as much rhubarb; and I have even found it necessary to give scammony at that early age.

The medicine failing to operate it often becomes necessary to repeat the dose in a few hours, sometimes till even half a dozen are taken in one day; and in some cases, days elapse before a free purging can be established. In children, as in adults, the size of the dose necessary to act on the bowels differs very much in different cases; some of four or five months requiring ten grains of calomel.

With regard to the time of giving the medicine, when the case is not urgent it is best to wait until bed-time, as it scarcely ever fails to quiet the bowels so much that the child sleeps, sometimes all night. So striking is this effect of a dose of calomel, or calomel and scammony, that parents have very often inquired if there was not opium in the powder.

Such is the relief often obtained in recent cases from the first operation, that the fears of the parents are quieted so entirely that they are apt to think it unnecessary to give another dose. The medicine must however be continued daily until the passages become entirely natural in colour, consistence, and smell.

In July 1816, I read Cheyne's essay on Atrophia Ablactatorum. I tried his doses of half a grain of calomel every four hours, and found them very often effectual, purging the patient well and bringing off green and black matter. Relieved, by the efficacy of these small doses of calomel, from the fear of producing ptyalism, which had occurred in one remarkably obstinate case mentioned above, I ran into the very common error of using the prescription in every instance that occurred; but soon found there were cases that would not so easily yield. On inquiring I found the passages in these cases were not changed and that nothing green or dark had been discharged; and on increasing the dose of calomel, or giving a dose of scammony or rhubarb and calomel, the proper operation was effected, the passages becoming green or dark, and by continuing the discharge the patient recovered. These small doses therefore are successful when they act on the bowels in the way above mentioned, and not without. There are indeed some slight cases in which they check the discharge for some time, or perhaps

entirely, and do not operate on the bowels in the way above represented as necessary. In these cases the recovery is not perfect, the child shewing manifest marks of indisposition, and very generally relapsing in a short time.

The diet may be any thing that the child desires and can retain. Milk and water sweetened, and *thickened milk* also sweetened, are as proper as any thing else. *Thickened milk* is made by pouring into milk boiling briskly, a thin mixture of milk and flower without lumps, and stirring the boiling milk while the mixture is poured into it, and for a short time after.

Having found the course of treatment above recommended entirely successful for many years, a few observations will suffice with respect to other remedies.

Bleeding is rarely strictly necessary, but blood might be drawn with advantage in many cases in which it is not attempted. Dr. Rush says in this disease children sometimes require bleeding two or three times.

Vomiting has been often recommended, but I have very rarely used it. Though emetics have unquestionably been administered with advantage, they sometimes increase the watery purging: to be useful they should operate quickly. They are chiefly beneficial in driving the blood to the surface and thus lessening the accumulation in the interior veins. Calomel which has so beneficial an influence in other respects, is often serviceable in this way likewise; and has this decided advantage over every other medicine operating in this manner, that the extension of its operation to the bowels is desirable.

Blistering has been greatly commended, and no doubt has considerable effect in quieting the excessive irritability of the stomach. But this remedy also I have for many years laid aside, inasmuch as the object in view can be more pleasantly and certainly effected by the same remedies that are necessarily employed as evacuants.

Anodynes are unnecessary. In an hundred instances, as was before observed, the mercurial cathartic given at bed-time has relieved the disagreeable sensations of the child so perfectly that it has fallen asleep at once.

Tonics I have never found necessary when purging was properly conducted. I formerly used them externally and internally, but with very little apparent benefit. When purging with mercurial cathartics, is conducted as above recommended, the patient recovers appetite, colour, and strength so fast, as to render it obvious that tonics are unnecessary. In some cases however the child is excessively debilitated and emaciated when application is made, sometimes in consequence of entire neglect and sometimes of improper treatment. Even in these cases the same plan is the best I have ever tried. A few years ago I was called to see a child who had been for many weeks affected with this disease. She had been treated with every thing but calomel. She was excessively emaciated, so that the skin of her extremities could be folded around them: tenesmus harassed her, as well as repeated vomiting and purging, every day, of a colourless thin fluid. She took two grains of calomel which immediately vomited her: smaller doses were then given, half a grain at a time, with about a grain of prepared chalk or white sugar to give some bulk to the dose; of these she took five or six every day: they produced in the course of forty-eight hours black passages, as was predicted, a circumstance alluded to before: they were continued daily for five weeks, producing every day consistent discharges of various colours: the dose was found not always sufficient to purge, and she took on one occasion as much as five grains of calomel at once. She took no other medicine. Her recovery was steady from the beginning and perfect in the time mentioned, and she became uncommonly fat and hearty.

ART. IV.—*Thoughts on the Circulation of the Venous Blood, and on Absorption.* By CHARLES CALDWELL, M. D. Professor of the Institutes of Medicine and Clinical Practice in Transylvania University.

HAVING stated, in a preceding memoir, our reasons for differing in opinion from Dr. Barry, in relation to what he alleges to be the causes of the circulation of the venous blood, it is our

purpose, in the present, to endeavor to show what the causes of that process are.

That it is much easier to demolish what is not solid, than to erect what is—to find fault with the opinions of others, than to form opinions that are themselves faultless, is a truth which we have not now to learn. An experimental knowledge of it has long since diminished not a little that self-confidence which was once sustained in us, in too high a degree, by the ardor, and buoyancy, and inexperience of youth.

Nor have we found ourselves, in many instances, less inclined, than in the present, to speak with that decision, which is warranted alone by a thorough conviction that our views are correct. We are sensible of the difficulties of the task we are undertaking, and trust we shall express ourselves with becoming caution. No sensibility, however, of the intricacy of our subject, or of the hazard we incur of running into error, in venturing to discuss it, shall make us shrink from the responsibility of asserting, with firmness, what we believe to be true, accompanied by such facts as we may be able to adduce, in illustration and confirmation of the opinion we entertain.

Previously, however, to our commencement of this investigation, we shall offer a few remarks on Dr. Barry's supposed discovery of the influence of atmospherical pressure on the process of absorption.

As respects the effects of this pressure on the functions of the human body, we are apprehensive that the Doctor is more radically mistaken, than he is with regard to the formation of a vacuum. As heretofore stated, we feel persuaded that a vacuum, or rather a tendency to one, is actually formed; but not by respiration. What we consider the cause of its formation will be mentioned in a subsequent part of this memoir.

In his examination of the functions of the human body, Dr. Barry appears evidently to have considered as the effect of atmospherical pressure, a phenomenon which is the result of the reaction of the system—not merely of its reaction on the atmosphere, but of the reaction of one part of it on another.

Throughout material creation, as far as we have any knowledge of it, it is action and reaction alone, that maintain the

balance and harmony of things. Destroy, or materially derange this reciprocal action, and confusion will ensue.

If the human feet press against the rock on which they rest, the rock presses with equal force against them; otherwise they would sink into it. If the freighted vessel presses on the water on which she floats, the water reacts with an equal pressure on her, else would she find her way to the bottom.

In like manner, if, as philosophers tell us, and as we are bound to believe, the atmosphere compresses the body of a common-sized man with a force equal to a weight of fourteen tons, his body must press on the atmosphere with equal force, otherwise it would necessarily be crushed and destroyed.

Now it is not the human feet pressing on the rock, nor the atmosphere pressing on the surface of the water, that gives to either the one or the other a power and a tendency to react. As well may it be alleged that the pressure of the rock makes the feet react, or that of the water, the atmosphere. The truth is, that each has a disposition and power to react, and is constantly reacting on all things in contact with it—the water on the atmosphere, and the atmosphere on the water—the rock on every thing touching it, and every thing touching it on the rock.

So has the human body the same uniform power and tendency to act on the atmosphere, in an outward direction, that the atmosphere has to act on it, in an inward one. Their action and reaction, therefore, are mutual, constant, and equal. Derange this equality, and disorder is produced.

Apply to the surface of the body your exhausted cupping glass, and what are the primary and consecutive effects? The pressure of the atmosphere is taken from the covered spot, and the blood forced into it, by the proper and inherent action of the parts.

In the production of these effects, atmospherical pressure has no influence. It is in vain to allege that the pressure on the parts around the cup forces the blood into the vessels of the part under it. No such thing. Were this the case, the skin in the vicinity of the cup would be pale, because from its vessels the blood would be more immediately pressed.

But nothing of this occurs. No more of paleness appears, than is produced by the pressure of the edges of the cup on the vessels of the skin directly under them. From these vessels only is blood forced; and there alone does any paleness appear, the skin around the cup retaining its natural colour.

But admitting that the pressure of the atmosphere does produce some effect on the superficial blood-vessels of the body, what influence can it possibly have on deep-seated ones; particularly those of the internal parts—the vena cava, vena portæ, vena azygos, and the veins within the cranium and the other hollow bones? and, more particularly still, what influence can it possibly have on the veins of the fœtus in utero? The answer is palpable. It can have no more direct influence on them, than it has on the central nucleus of the earth.

The inherent power and positive tendency of the living body to act in an outward direction, are clearly demonstrated by the accidents that often occur to travellers, in their passage over lofty mountains. These accidents are hemorrhages from the lungs, nostrils, and eyes; and a preternatural injection of the entire skin with blood. Nor does the cause of them appear to be difficult of discovery.

The atmosphere being much more attenuated on the tops of lofty mountains, than it is at the common level of the earth's surface, its pressure is, of course, in an equal degree diminished. But the human body is so organised and endowed, as to be in harmony with the pressure at the latter elevation. Raise it to the former, and this harmony is destroyed.

On the tops of mountains, therefore, the outward pressure of the system is too forcible for the diminished resistance of the atmosphere to control. Hence the motion of the blood becoming too violently centrifugal, that fluid is thrown in preternatural quantities on all the external surfaces of the body. But the eyes, nares, and lungs, are all in the condition of external surfaces. And their vessels being weak, they suffer the blood, which is forcibly thrown into them, to escape, either through ruptures, or inordinate dilations of their mouths.

Will Dr. Barry allege that hemoptisis occurs on the tops of mountains, in consequence of the atmospherical pressure on

the lungs being diminished, while on the other parts of the body, it remains sufficiently strong to propel the blood in preternatural quantities into the non-resisting pulmonary vessels, and thus produce the specified hemorrhagy?

We reply, that the pressure of the atmosphere, on every part of the body, is diminished in precisely the same degree. It can, therefore, no more force the blood from other parts of the body into the lungs, than it can throw it from that organ into other parts. The relation between the atmospherical pressure and the body generally is changed. And this change has reference alike to every portion of the body with which the atmosphere comes into contact.

If the pressure on the lungs is diminished, it is equally diminished on the entire surface. The balance is broken, then, only between the external and internal parts of the system. In the former, the blood vessels, no longer sustained by their accustomed pressure, are comparatively debilitated, while the outward action of the latter, remaining unchanged, throws blood into them with a degree of violence which they cannot withstand. Hence the hemorrhagy, and general superficial engorgement which ensue.

Dr. Barry assumes the credit of an important discovery, in relation to the influence of atmospherical pressure on the process of absorption.

In this hypothesis he is equally vulnerable, as in that which relates to venous circulation. That this is true, will satisfactorily appear from a brief examination of the fact, on which alone the hypothesis is founded. The fact is substantially as follows.

Having infused poison into a recent wound, apply a cupping glass over it, and the deleterious effect of the poison will be prevented.

That this is true, will not be denied. But it is no discovery by Dr. Barry. It has been known not only for ages, but by the most ignorant and uncultivated nations.

The action of a cupping glass is nothing but suction. And the practice of extracting poison by that process is as old as history, and as common among the aborigines of America, as it

has ever been among any other people. Those savages, when bitten by a serpent, avert the mischief by sucking the wound themselves; or if it be inaccessible to their own lips, by having the office performed by the lips of their comrades.

Such is the fact. But the true philosophy of it is very different from that assigned by Dr. Barry. In the poisoning of the wounded animal, when it takes place, real absorption has no concern. Nor has the suspension of absorption any influence in the prevention of poisoning.*

Admitting that the poison makes its way into the mass of blood at all (a supposition which is perfectly gratuitous) it does

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*By some of the numerous experimenters of the day, much is said on the subject of "venous absorption."

Nor to the hypothesis of venous insterstitial absorption, i. e. absorption by veins from the real parenchyma of the body, are we inclined to oppose any serious objections. That question is perhaps unsettled.

But that veins ever absorb water and other fluids, as some physiologists contend they do, from the cavity of the stomach, we do not believe, for two reasons, which to us are satisfactory.

No veins open on the internal surface of the stomach. Why should they? Their function is to re-convey to the heart the blood which the arteries have carried from it.

But of this blood, none, in a healthy condition of that organ, is poured into the stomach. For veins, therefore, to open into it would be altogether superfluous. Having no blood to receive there, such opening would be without an object—a work of perfect supererogation. But, in her normal course, nature is chargeable with no superfluity.

Nor, if veins did open into the stomach for the reception of blood, is it probable that they would take up any other fluid but blood. Such would be their appetency and power of rejection, that they would close their mouths against all heterogeneous matter. As the lacteals accept nothing but chyle, because that alone is in harmony with them, the veins, for a similar reason, would accept nothing but blood.

Whatever fluids are absorbed from the cavity of the stomach, are, most probably, taken up by vessels provided by nature for that purpose, and nothing else. By genuine veins it is not done.

To that hypothesis which attributes to the same organ a variety of discrepant appetencies and offices, we are unwilling to subscribe. If we are not greatly mistaken, nature effects her entire economy by specific agencies.

In the animal system each organ performs its own allotted function, and no other. Were not this the case, the organs, like the members of a badly regulated society, would impede each other in the discharge of their duties. But, when in a healthy condition, this is not the case. On the contrary they co-operate harmoniously, each individual giving aid to the whole.

it by means of capillary circulation. It is introduced into the capillaries through the wound, mingles with their blood, and is carried along by the same powers which impel that fluid.

Dr. Barry informs us, that if the cupping glass be applied, the poison infused is not only prevented from entering the system, and doing mischief, but is actually extracted from the wound, and may be wiped from the surface of the part. The statement is correct.

Nor is there any difficulty in perceiving by what process the effect is produced. It is perfectly plain, that the poison is discharged from the vessels in which it had been deposited, and washed out of the wound, by the flow of blood which the suctions brings on. Should no blood issue from the wounded capillaries, the venom would remain.

If, in inoculating with variolous or vaccine matter, much blood flow from the puncture, it is well known that the virus is thrown out, and produces no effect. The blood carries it from the living and irritable parts, and deposits it on the surface of the cuticle, from which it is afterwards, in some way, removed. Or if not removed, produces no disease.

In like manner, when, by a cupping glass, the pressure of the atmosphere is removed from a poisoned wound, the outward action of the part pours out the blood, and washes the poison from the vessels in which it had been deposited. It is not, then, by its anti-absorbent, but by its hemorrhagic influence that suction prevents the effects of poison.

If the poison introduced, by a wound, into the capillaries be liquid, it is, perhaps, possible that it may find its way, through the veins, into the general mass of blood. But if it be a solid, such as arsenic, we are persuaded it never does. It then produces, sympathetically, its deleterious influence, by irritating the part to which it is applied.

That the variolous and the vaccine poisons, when introduced by inoculation even in a liquid state, act in this way, cannot be doubted. They never produce their constitutional affections, except as the result of a local one. But, did they act only by being introduced into the general mass of blood, this would not be the case. They would be absorbed more readily and

certainly, without a local inflammation, than with it. In that affection, the engorged capillaries of the part are, in some degree, torpid; and, unless ulceration be going on, the absorbents also act with less than their usual vigour. To facilitate absorption, then, and to render it certain, nature never institutes local inflammation.

As relates to absorption generally, Dr. Barry's views appear to us to have no foundation in truth. In common with his hypothesis respecting venous circulation, with which they are associated, they are too mechanical and common, to comport with the principles and modes of action of living matter.

The absorbents in all their branches, including the lacteals, are united to the veins. The doctor considers their functions, therefore, as depending entirely on the same vacuum which he says respiration produces in the thorax, and to which he attributes venous circulation. In his opinion, this vacuum sucks from the absorbents their contents, at one end, while the pressure of the atmosphere forces fluid matter into them, at the other.

According to this hypothesis those vessels are mere conduits for the conveyance of such liquids as may be accidentally at their mouths, and pressed into them by external force. They have no power either to select their contents, that they may be of a suitable character, or to change and assimilate them during their passage. Mechanical pressure being indiscriminate, whatever fluid sufficiently thin may be at their mouths, must enter them, and pass into the blood without the slightest change. Their fluid, moreover, being moved by the same power that moves the venous blood, must flow with the same degree of velocity.

From the premises laid down, this last inference is inevitable. Take any system of tubes having their cavities united and in common, throw a liquid through them by the same projecting force, and that liquid must move in all parts with the same velocity. If it did not, congestions, ruptures, and other accident and irregularities would be perpetually occurring.

But no one, we believe, has ever alleged, nor would there be any truth in the allegation, that the lymph and the chyle

flow as swiftly along the lymphatics, the lacteals, and the thoracic duct, as the blood does along the veins. On the contrary, the difference in the velocity of those fluids is great.

To avoid the posibility of misrepresenting or destroying any of the views of our author, which make a part of his hypothesis on this subject, we shall present them to the reader in his own words.

After having drawn from what he denominates facts and experiments six conclusions, his seventh is as follows.

"7thly. That the lymph and chyle must be sucked up towards the chest, through the direct communications which the vessels peculiar to those fluids have with the subclavian and other veins. The question of absorption, therefore, which has hitherto puzzled physiologists so much, may now be considered as decided; for it is clear, that the open mouth of a vein, or any other vessel having the same kind of communication with the thoracic pumps, must absorb in direct proportion to the sucking power applied to it, and to the pressure exercised upon the matter to be absorbed."

This language is not only perfectly explicit, but strong, and, in no inconsiderable degree, self-complimentary. In confidently declaring that he has "decided" the high and puzzling question of absorption, our author's pretension to distinction is lofty and bold. He attempts, by it, to place himself at the head of the physiologists of the age. Whether this attempt be meditated usurpation, or an act of legitimate succession, a further analysis of the subject may perhaps enable us more fully to decide.

Far from shedding even the faintest light on the problem of absorption, much less of completely solving it, Dr. Barry's hypothesis, as far as it can have any influence, is calculated to envelop it in deepened obscurity. It throws it back an entire century, and buries it under the rubbish of mechanical philosophy. In alleging that the absorbents and lacteals have no specific action, it denies to them, as already stated, the power of either selecting their contents, or producing any change in them in the course of their passage. It virtually asserts, that while, at their termination in the veins, suction draws from

those vessels whatever matter they may contain, pressure forces into their mouths whatever fluid may be in contact with them. Apply this hypothesis, and mark the consequences.

With the mouths of the lacteals are brought into contact the entire contents of the small intestines. According, then, to the hypothesis we are examining, the fluid in the lacteals (the chyle) should be precisely the same with those contents, except so far as some portion of the latter might be too gross to enter the caliber of vessels so minute. And this sameness should continue, until the chyle was emptied, not only into the thoracic duct, but into the left subclavian vein.

In fewer and plainer terms, the hypothesis of Dr. Barry declares, that the only function of the lacteals and thoracic duct is, to carry promiscuously and unchanged, into the venous blood, the common contents of the small intestines—or, at least, so much of them as may be of a suitable consistence, no regard being had to any other quality!—A declaration as gross and revolting as error can make it. With the slightest knowledge of digestion and chylification, no one can believe it.

That the chyle differs greatly in character from the contents of the small intestines, cannot be denied. As well might it be denied that there exists any difference between it and the blood. Nor do the mouths of the lacteals endure the slightest pressure from the air of the atmosphere, to force into them their contents. To assert the contrary is to depart from fact, and violate common sense.

Account for it as we may, the lacteals possess a power of selection. They take up that portion of the fluid of the intestines that is properly prepared for them, with an instinct as unerring, as that with which the animals of the forest select their food.

Nor is this all. They further assimilate and mature the chyle, as they carry it towards the subclavian vein, by their specific action.

If they are nothing but mere conducting pipes from the intestines to the blood, why is their course so long and circuitous? and why are they obstructed by the mesenteric glands? Wherefore do they not, without such obstruction, open, at once, into

the vena cava? We call on Dr. Barry to answer these questions. Or, to save him the trouble, we will ourselves, in substance, answer them for him.

The intention of nature, in lengthening and flexing the tract of the lacteals and the thoracic duct, appears evidently to be, to enable those vessels the more perfectly to mature the slow-moving fluid they carry, and duly prepare it for admission into the blood. And to the same end have they connected with them the mesenteric glands, which, while they further retard the movement of the chyle, aid in preparing it for its ultimate destination.

On the principles of Dr. Barry's hypothesis, not a single act, or mode of operation of the absorbents can be explained.

Those vessels contribute essentially to nutrition and growth. To make room for the new matter which is to be deposited in those two processes, they carry off from every part of the body, that which is already old and worn out. In the performance of that important office, they remove alike the matter of bone, cartilage, tendon, muscle, gland, and every other organ of which the body is composed.

Nor do they merely remove those discrepant and heterogeneous masses of matter. They convert the whole of them into a well assimilated and homogeneous fluid.

Between the lymph formed from bone or tendon, and that formed from gland or muscle, there is no perceptible difference. As all the solids of the body are formed and nourished from the blood, by a set of vessels appropriated to the purpose, so are they all converted into lymph, by the action of the lymphatics.

Conformably to the principles of his hypothesis, how will Dr. Barry explain all this? Can atmospherical pressure and the suction of a vacuum first convert into lymph, bone, tendon, cartilage, muscle, and every other solid part of the body, and then force it into the absorbents? In a particular manner, can they do this within the cavities of the cranium, the femur, and other hollow bones, in all of which absorption certainly takes place, but where the pressure of our atmos-

phere is no more felt, than it is on the surface of the planet Herschel.

The absorbents act within the gall-bladder, taking up part of the cystic bile, but not without selection; they hollow out the cavities of deep-seated abscesses, and produce, by their action, exfoliations of bones. In fact, the various offices they perform are, in all cases, conformable to the varying conditions and exigencies of the system.

Nor can one of those offices be accounted for by the hypothesis of Dr. Barry. According to that hypothesis, the action of the absorbents must be perfectly uniform, because the only power concerned in it is always the same. But, as already shown, that action is exceedingly varied, according as the modified state and condition of the system require it to be so. It need scarcely be stated, that nothing but the flexible and plastic powers of living matter can thus change and accommodate their mode of action.

We shall now proceed to offer a few remarks on what we consider the true causes of venous circulation. We believe them to be the two following.

1. The proper action of the veins, as living tubes.

2. A degree of suction effected, not by respiration, but, by the right auricle of the heart, in its tendency to form a vacuum, by its act of expansion.

Did not the veins, by their own action, aid in the circulation of their contents, that circulation would go on as well under an unsound and debilitated, as in a healthy and vigorous condition of those vessels. But this we know is not the case.

In old age, when the veins have begun to fail in their powers, their blood moves more languidly and slowly; and, in consequence of this, their volume becomes enlarged. In no other way can the augmented size and fulness of the veins, in very advanced life, be rationally explained. Nor can we, on any other ground, account for the greater liability of that period of existence to diseases of venous congestion. But, viewed on the principles here laid down, those phenomena become perfectly intelligible. Connected with these considerations let it not be forgotten, that respiration goes on as freely in the

old as in the young; and is, therefore, in each, calculated alike to aid in the process of venous circulation.

But another case stronger and more pertinent to our purpose can be adduced. It is that of varicose veins. The cause of this affection is disease and debility in the enlarged vessel. It does not, as some contend, arise from a disease of the valves alone. As is true of an artery, in a case of aneurism, the entire tube is in a morbid condition, and is, therefore, unable to propel its contents. Hence, like debilitated capillaries, in congestive affections, it becomes enlarged. But we repeat, that this could not be the case, did not the veins keep the blood in motion by their own action.

Another example in point may be adduced. Indiyiduals sentenced to death by hanging, have been cut from the gallows before the entire extinction of life. By the employment of venesection, and other suitable means, full animation has been restored, and, in the arms and lower parts of the body, circulation has become complete. But not so in the head and neck. In a few minutes after the re-establishment of circulation, the re-animated culprit has died apoplectic. The reason was, that by the violent pressure of the cord, the jugular veins had been so far injured, as to be paralyzed in their action, and rendered unfit to transmit their blood to the heart. In the mean time, the blood thrown through the carotids on the brain, accumulated there, and produced the disease.

Congestion in the vena portæ and other veins, is to be attributed chiefly to the weakened action of those vessels. Were venous circulation effected on the principles of Dr. Barry's hypothesis, such congestions could never occur, unless respiration were suspended; and then venous congestion would be general. Establish those principles, and local congestion in the veins will cease to exist.

As mentioned in a former memoir, all analogy is favourable to a belief in venous action. The sap-vessels of vegetables produce the motion of their own fluids; and so, in the human body, do the ureters, and the salivary, biliary, and pancreatic ducts. In the movement of the fluids which those tubes convey, no vacuum is supposed to lend its aid. Of the entire absorbent sys-

tem the same thing is true, as we trust, has been made satisfactorily to appear, in a preceding part of this memoir. In the existence of a similar action, then, of the venous system, we are fully and legitimately authorized to believe. That that action is not cognizable to any of our senses, constitutes no solid reason why we should not admit that it exists. The doctrine of insensible action in living matter, is as indubitably established as that of sensible.

But as the arteries give some aid to the heart in arterial circulation, so does the heart aid the veins, in venous circulation. And the following is the manner, in which, in the latter case, the aid is afforded.

The heart acts in a twofold way, contraction and expansion. By many we know this position is denied—among others, by Dr. Barry. The heart, say those physiologists, contracts and relaxes; but does not of itself, actually expand. Its expansion, when it occurs, is a forced condition, the result of some adventitious power, and not of the inherent power of the organ. The heart, they continue, has no muscular fibres, by whose action its expansion can be effected.

We reply, that, in the present instance, our search is not after causes, or reasons of action, but action itself, and recognized effects. Our object is facts; and it is an indisputable fact, as will appear frequently, that by means of its own inherent power, the heart does expand, as certainly and regularly as it contracts.

Had we leisure to engage in the discussion, we think it might be established as a further fact, or at least, rendered much more probable than the contrary opinion, that not only the heart, but all hollow, more particularly all sphincter muscles, possess also a power of genuine expansion.

That the heart is endowed with such a power, is demonstrable by an experiment, which every one may perform, and which we have ourselves performed repeatedly.

Stun an animal by a blow, or otherwise diminish its sensibility, to prevent torture, and, while life still exists, extract the heart, and observe its action.

In this condition, the contraction and dilatation of that organ will go on as regularly, although not, perhaps, so rapidly, as they did when it was engaged in giving circulation to the blood. We say "dilatation" not mere relaxation, as some assert the phenomenon to be.

By relaxation we must understand, an absence of action—in the present case, a mere ceasing to contract, and nothing more.

But, in the phenomenon which the extracted heart exhibits, there is something more. By contraction, that organ diminishes its size, and alters its shape. Did it then entirely cease to act, its existing shape and size would continue. But this is not the case. It immediately resumes, by a movement that is perceptible, the figure and magnitude it exhibited previously to contraction; and which by that process it had lost. And this it does without the application of any adventitious and modifying force.

Here, therefore, is exhibited precisely as much action in the organ's expansive return to its original dimension and form, as there is in the contraction, by which that form and dimension were altered. The one is an exact counterpoise to the other. Does contraction take from the heart its native size and shape? Dilatation restores them.

Will any one allege, that the act of restoration is produced by the atmosphere? That when the heart contracts, it expels from its cavities the air they contained; and that, on its relaxation, the air, by its elasticity, forces open its auricles, and again fills them.

We reply, pass ligatures around the vena cava, pulmonary artery and veins, and the aorta, so as completely to exclude the atmosphere, and the contraction and dilatation will go on as before.

But this is not all. Let the heart be large and strong, and, when it is in action, grasp it gently with the finger and thumb, and its expansive force will be distinctly felt—perhaps not less distinctly, than will its contractile force, if the finger be introduced into one of its cavities.

Now, as respects the theory of venous circulation, of which we are advocates, it is of no moment whether this dilatation is

produced by the common action of muscular fibres, or by the elasticity of the substance of the heart. It is sufficient for our purpose that it actually occurs; a position which we hope has been satisfactorily established. Its influence in the circulation of the venous blood, must be apparent, we think, to every one who will examine the subject with that degree of attention to which it is entitled.

When, in the living and healthy subject, the right auricle of the heart contracts, it completely empties itself of its blood, which passes immediately into the right ventricle. In this state of things, let the auricle expand again, without receiving from the vena cava a fresh supply of blood, and what will be its condition? The answer is plain. Its cavity will constitute a perfect vactum. When, therefore, it begins to expand, a vacuum in its cavity begins to be formed. But, as nature never permits a vacuum to exist, the blood of the vena cava is hurried into it, by the proper action of the vein, united to the same power of the system, that forces blood into the vessels beneath an exhausted cupping glass, and immediately fills it. The auricle again contracting and emptying itself, and again expanding, forms another commencing vacuum, which is again filled on the same principles; and thus perpetually, while the heart continues its natural action.

It is still believed and contended by physiologists of elevated standing, that, under the denomination of vis a tergo, the blood continues to feel the propulsive influence of the left ventricle of the heart until its entrance into the right auricle.

This opinion, for sundry reasons, which to ourselves are satisfactory, we believe to be unfounded.

Were it true, the blood could not fail to flow from a punctured vein per saltum, precisely as it does from a punctured artery. But that, as a general rule, it does not thus flow, is known to every one.

If, in any case, the blood issues per saltum from a vein, it is owing either to the influence of an adjacent artery, to intermittent muscular pressure, or to some irregularity in the action of the vessel itself.

From the true capillaries, when wounded, and the real parenchyma, which lie between the left heart and the veins; the blood never flows in broken jets. It is impossible, therefore, that, by the action of the heart, it can thus flow from the veins. If the capillaries do not feel the propulsive power of the heart, a fortiori, the veins do not feel it.

To experience directly the force of the heart, the veins ought to receive their blood immediately from the arteries. But they do not. Perhaps they do not receive it immediately even from the capillaries. The opinion of certain distinguished physiologists is, that the capillaries deposit their blood in an unvascular parenchyma, from which the veins take it up by absorption.

Be this hypothesis as it may, we feel persuaded, that, if at the commencement of the venous system the blood experiences a vis a tergo, it proceeds from the action of the capillaries and parenchyma, not from that of the left side of the heart. Nor, even supposing it to exist at all, does it appear to us probable, that such a force has any appreciable agency in venous circulation. If, without such aid, the lacteals and the other branches of the lymphatic system keep their fluids in perpetual motion, we know of no satisfactory reason why the veins should not do the same.

Is any one inclined to charge us with admitting, in this view of venous circulation, the same kind and amount of mechanism, with which we found fault, in the hypothesis of Dr. Barry? We answer, that the charge is not well founded.

Although we admit, and feel compelled to admit, the formation of a vacuum, and the forcible propulsion of the venous blood into it, we do not, for either the one or the other, resort to any thing but the powers of the system. To aid the living body in the performance of its functions, we do not call in the influence of dead matter. We do not represent the system as defective and impotent in itself; but contend that it is so constructed and endowed, as to be, in all respects, competent to its own œconomy.

If, on the subject of venous circulation, our views embrace mechanical principles, they hold them in subserviency to the powers of life. And this is indubitably true of the action of

the heart in contraction. Every one admits that that organ performs then, the office of a forcing pump, making thus its vital powers give effect to its mechanical structure.

In the process of parturition, the uterus acts mechanically; in discharging their contents, the bladder, bowels, and other parts concerned with them, act in the same way; and so do the diaphragm and other muscles, in the process of respiration. Indeed muscular action generally participates of mechanism, without which it could not be performed with any degree of efficiency.

But in all these instances, the vital powers constitute the spring of action, while mechanical structure serves only as the means. The muscles and other parts properly organized and arranged, constitute the corporeal machine, the powers of life being the soul that animates it, lifts it above dead matter, and imparts to it motion.

But according to the hypothesis of Dr. Barry, the pressure of the atmosphere constitutes the "primum mobile" of venous circulation; and, under a suitable mechanical arrangement, could carry on that process in a system of dead tubes, as well as living ones. And such is the precise view of it which he himself expressly gives.

In conducting the œconomy of the living body, then, vital powers employ mechanical ones, but are never subordinate to them. Nor is a single function performed by mechanical powers alone.

An unnatural attachment to chemical and mechanical medicine, as we have had occasion elsewhere to observe, has been in every country and age, at once the bane and disgrace of our profession. And it is matter of regret and deep lamentation, that even the brightening sun of the present period, genial and powerful as it is, far beyond that of every other, in producing and ripening the invaluable fruits of common sense, has not yet been able to put to flight the phantoms of error, which a dislocated philosophy had collected around the subject.

But the day-star is up, the morning is advancing, and a meridian of resplendent glory is at hand. As relates to medicine, the orb of true science is high in the ascendant. With the

wrapt enthusiasm of the poet, almost might the medical philosopher exclaim,

"Magnus ab integro seclorum nascitur ordo!
"Jam nova progenies cœlo demittur alto!"

And almost might all other votaries of truth unite in the exclamation, under an inspiring conviction, that the period is approaching, when they may, without violating her ordinances, address to their Idol the additional clause,

——————"tuus jam regnat Apollo!"

There yet remain, connected with the circulation of the blood, further considerations, which may perhaps form the subject of another article.

ART. V.—*On the Chemical changes that take place on the atmospheric air, and upon the blood, during Respiration.* By JAMES BLYTHE, D. D. Professor of Chemistry in Transylvania University.

It is known to every person, that respiration, or something analogous to it, is indispensable to the support of life; and few persons can be ignorant, that in man, and in the whole tribe of hot-blooded animals, the lungs are the organs by which this operation is performed.

Respiration consists in receiving into the lungs a certain portion of atmospheric air and again expelling it.

The operation of breathing, very much resembles as to the manner in which it is performed, that of a pair of common hand bellows. Every one knows that when the boards of the bellows are separated, the air rushes in, not by suction, but by pressure. In like manner, when in the act of respiration the chest is enlarged, the air of the atmosphere presses in, to fill up the capacity. Every operation of this kind is the result of a principle in fluids known to every school-boy, viz. they will always flow towards that place where the pressure is the least. Air rushes into the lungs when we inspire, for the very same reason that water runs down hill. Inspiration is the only part of respira-

tion which requires any muscular action. Expiration is performed by a mere suspension of action; hence expiration is always the last act of a dying person.

The fluid inspired by animals is atmospheric air; and the most correct experiments have ascertained, that no other fluid can be substituted for it. Many of the gases have been tryed, but all sooner or later have proved destructive. Some of the gases such as oxygen, can be breathed for a length of time, not only with impunity, but perhaps with benefit in certain diseases; but if persisted in, they all produce such a change upon the system as to induce death; while others, such as carbonic acid gas, nitrogen gas, &c. if attempted to be substituted for atmospheric air, produce almost instant death. Science therefore pronounces that there is a physical and wise adaptation of atmospheric air to animal life. It is this adaptation that makes respiration a proper subject of chemical investigation.

Gaseous bodies, so far as respiration is concerned, may be thrown into two classes. First, irrespirable gases. Second, respirable gases. Those which belong to the first class, are of such a nature, that they cannot be inhaled at all, the organs of respiration closing spasmodically, so soon as the gas comes in contact with them. Carbonic acid gas, and probably all the other acid gases, belong to this class, as seems to be proven by the experiments of many chemists, and particularly of Rozier.

The second class of gases may be inhaled, and again exhaled; and this process can be repeated several times upon the same portion of atmospheric air, but finally it loses its power of sustaining life, and is converted into a substance that is highly poisonous, and produces suffocation as effectually as the most noxious gases, or a total want of air.

From the above facts, which will be doubted by no one, we are authorized to draw the following conclusion, which presses itself upon us: viz. The respiration of atmospheric air either removes some offensive matter from the system, or imparts some essential principle to it, which is indispensable to life. We are inclined to believe that the air sustains life principally, if not exclusively, by removing, in the act of respiration, some offensive matter from the system. To suppose the air to vitalize

the animal system, is to suppose one of two things; either that the air imparts a principle which itself does not possess, or that the air itself is vital. The former supposition involves an absurdity in philosophy. The latter supposes that which no sound philosopher has ever admitted. It supposes the air to be vital; when in fact it is no more entitled to this predicate than is water.

Dr. Black's simple experiment of breathing thro' lime-water, (a perfectly transparent fluid,) and presently rendering it milky, indicating a conversion of the lime into a carbonate of lime, is a decisive proof that one offensive matter is given off by respiration. But if any should be so incredulous as to disbelieve this palpable indication, let him parallelize this experiment by treating two portions of lime-water, the one with air expired from the lungs, the other with a few drops of water rendered acidulous by the addition of carbonic acid: The eye will immediately point out the identity of the two fluids. But if further proof be needed of this identity, the addition of a few drops of sulphuric acid will produce the liberation of carbonic acid gas from both, and the deposit of the sulphate of lime.

Thus we prove that one offensive substance is thrown off from the system by respiration; we shall presently adduce another proof of the same fact as it respects the same substance.

No one will be disposed to question that another substance, in great abundance, is thrown out of the system by respiration. Water is found in considerable quantity in expired air;* not in the state of vapour, as has been universally supposed, but merely in the state of highly-attenuated water.

We lay this down as a fact, respecting which, so far as we know, there is no diversity of opinion; That the quantity of oxygen found in the expired air is considerably less than that found in the air when it was inspired. There is not a chemist or physiologist, who has ever denied this fact. With this acknowledged principle we set out.

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* I hope to be able to prove in a subsequent paper, that water rarely exists in the atmosphere in the state of vapour, but almost always in that of chemical combination.

It appears that the number of respirations in a given time, differ considerably in different persons. A man on whom Dr. Menzes made experiments, breathed only fourteen times in a minute. Sir Humphrey Davy breathed twenty-six and twenty-seven times in a minute. Dr. Thompson nineteen times. We think the average may be placed at twenty. Now twenty respirations in a minute, will give 1,200 in one hour, and 28,800 in twenty-four hours.

The quantity of air pressed in and emitted, in the act of respiration, differs considerably in different sized men, owing to the different capacity of their lungs. I have taken considerable pains to compare the experiments of different philosophers on this subject, and have taken as a pretty near approximation to the truth that 280 cubic inches, is the ordinary quantity contained in the lungs of a full-grown man; and that 40 inches, or one seventh of the whole is taken in and thrown out, at every ordinary respiration. This, supposing twenty respirations in a minute, will make the quantity of air pressed in and thrown out of the lungs, amount to 800 cubic inches in each minute, and 48,000 in an hour, and consequently 1,152,000 inches in twenty-four hours, which amounts to 52 1-2 pounds avoirdupoise.

We have been thus minute in these calculations for two reasons. Because we are convinced no man ever did or ever will make any successful progress in science who is not in the habit of taking aggregations and compositions, and looking at them in detail. It is easy to say the world we inhabit is made up of earth and water, but is *this* science? It is easy to say that the animal system is *vitalized* by atmospheric air, but is this science, or does the proposition impart to the mind any specific idea? But I have another reason for being thus minute in the above calculations; I mean to make another use of this immense quantity of 1,152,000 cubic inches of air used by every man in twenty-four hours; this use will appear presently.

We will now endeavour to trace the changes induced by respiration. It is evident to all, that these changes are of two kinds, viz. 1st, The changes produced upon the air expired. 2d, The changes produced upon the blood exposed to the air

inspired. Each of these facts demands our attentive consideration. We are indebted to Allen, to Davy and Bostock, for all we know about the changes produced on the air by respiration. The following are the changes. 1st. Part of the oxygen respired disappears. 2d. Carbonic acid is formed in its place. 3d. It is loaded with water, whether in the state of vapour or otherwise, we shall not now stop to enquire.

According to Davy, air by a single respiration is diminished from one seventh to one hundredth part of its bulk. Dr. Bostock takes one eighth as the average diminution, and 40 cubic inches as the quantity drawn in in each inspiration. Thus it will follow that half a cubic inch of air disappears each time we respire. This in a day would make 14,400 cubic inches. What becomes of this 14,400 cubic inches of air that disappears in the course of a day? One of two things I conceive must take place; either part of the nitrogen goes into the circulation, which is not contended for by any, nor is it agreeable to fact, the volume of nitrogen expired being exactly equal to the volume inspired; or a portion of oxygen equal to half a cubic inch in each respiration goes into the system. Thus the exploded theory of Lavoisier, will be received. And it will be found to be true, that by respiration the blood is oxygenized. This we believe to be true. We shall presently see if it be not also decarbonized.

When the air drawn into the lungs is thrown out again, it contains a quantity of carbonic acid, which did not exist in it previous to its being used in respiration. Dr. Menzes erroneously supposed that the bulk of the carbonic acid gas formed, was exactly equal to that of the oxygen consumed. Crawford and Davy found it to be nearly equal; that is the bulk of the whole air employed, was at a single respiration diminished about one eighth part, or half a cubic inch; and as we have seen above, this diminution must be entirely in the oxygenous part of the air inspired. Therefore this eighth part of the air inspired, or half a cubic inch of the oxygen, goes to oxygenize the blood at each inspiration, while the rest of the oxygen combines with the carbon, secreted, if you please, from the blood in the lungs, and converts it into carbonic acid.

in which form it is expired. I know it has been said that no gaseous matter can exist in the blood, and that this is a perfectly homogeneous fluid, than which nothing can be more untrue. It may well be doubted whether there is any *fluid* substance in which there does not exist some gaseous matter. We know that water contains atmospheric air in abundance; and that when it is deprived of this air, its life-supporting energies are diminished; and I know that blood contains carbon in the state of carbonic acid gas. The following experiment fully establishes the last proposition.

I caused a wine glass of blood to be drawn from the arm of one of the medical class, in the winter of 1823–4. I instantly placed this blood in company with a similar glass, having recently-made lime-water in it, under the bell-glass on the pump plate, and exhausted the air from the receiver, and permitted the whole to remain for several hours. Upon examination a pellicle of the carbonate of lime was found on the surface of the lime-water. How was this pellicle formed, if it was not by the carbonic acid gas that was liberated from the blood? I am not ignorant, that so tenacious have some philosophers been of what they call the homogeneality and vitality of the blood, that they have contended that no foreign matter could be injected into the veins of a living animal without inducing death. This is a great mistake. I have myself in company with several of the medical class of Transylvania University, injected into the veins of dogs, a portion of laudanum, of tartar emetic, and of the prussiate of potash. Each of these substances produced its legitimate effects. The tartar emetic puked its subject, the laudanum induced sleep, and the most beautiful prussian blue, was formed from the urine of the third, by the addition of the sulphate of iron. Death did not ensue in either case nor any alarming symptoms.

If therefore carbonic acid, in the state of gas is found in the blood, and even liquid substances may be made to circulate in that fluid without doing injury, why may we not suppose half a cubic inch of oxygen to pass into the circulation in each respiration? Besides it is well known that two effects invariably follow upon exposing a portion of blood drawn from a vein

of any animal to an atmosphere of oxygen gas. 1st. The black venous blood becomes florid. 2d. The volume of the air is diminished. Says Dr. Edward Goodwin, in the sixty-first page of his small work on "The connexion of life with respiration," "It has been often asserted, that black blood fresh drawn, and exposed to oxygen becomes florid. To ascertain the truth of this assertion, I enclosed a quantity of oxygen gas in a glass receiver inverted in quicksilver, and introduced into it four ounces of blood fresh drawn from the jugular vein of a sheep; the blood became instantly very florid, and the quicksilver seemed to ascend a little in the receiver. To ascertain this latter circumstance, I repeated the experiment three or four times; the change of colour was always very sudden, and after several minutes, the quicksilver ascended two or three lines. It is evident then that oxygen air changes the colour of the blood, and that a small portion of the air disappears in the process." But are the changes in this experiment similar to those in respiration? I would infer that they are induced by the same cause. My principal object in making this quotation, is not to prove that the oxygen inspired is the cause of the change of the colour of the blood, for we are not on that subject now, but to prove that the blood, even after having been drawn from the vein combines either mechanically or chemically, probably the latter, with a small portion of oxygen, whenever that gas is presented to it. Can we upon any other principle account for the rising of the quicksilver in the above experiment? Take another experiment from the same work, page fifty-first.

The volume of air taken into the lungs at a single respiration contained,		The volume of air expelled at the next expiration,	
Nitrogen	80	Nitrogen	80
Oxygen	18	Oxygen	5
Carbonic acid	2	Carbonic acid	13
	100		98

It appears from the above experiment, that in a complete respiration, the nitrogen remains unchanged, that thirteen parts of oxygen have disappeared, and that eleven of carbonic

acid have been generated, and that the whole volume is diminished by two. The very striking similarity between this and the above calculation, must strike every attentive reader. We are now considering the effect produced by respiration on the air. When we come to consider its effects upon the animal system, and especially upon the blood, we shall consider whether these effects are mechanical or chemical. In the mean time we ask by what power is the air acted upon in the process of respiration? We answer, the effects are chemical, whoever or whatever the chemist may be.

What do we mean by chemistry? I answer that nothing more is meant by it, than the composing and the decomposing powers of nature, and that too whether these powers are resident in living or dead matter. The atmosphere is decomposed by the process of respiration, that is the oxygen is separated from the nitrogen, and a *tertium quid* is formed, to all the amount of eleven parts in one hundred, and two parts of the oxygen have disappeared. And now is it any matter whether this decomposition of the atmosphere, and composition of carbonic acid be formed in Sir Humphrey Davy's lungs or in his eudiometer? Is it less chemical because it is performed by attraction that never fails, except the laboratory is out of order, or some of the vessels broken?

I am well aware that many sound philosophers have excluded chemistry altogether from the living world. They have put into the hands of the chemist, a very short sceptre, and they have commanded him not to presume to extend his reign beyond dead matter. Now if this command had been issued in mild terms, accompanied by sober philosophical reasoning, perhaps all the distinguished chemists of the age would have been disposed to have expunged from their works, those chapters denominated "*vegetable and animal chemistry.*" But as this has not been done, they choose to retain those chapters, adding something to them in each edition of their works. The whole of animal and vegetable developments, are by the first mentioned set of philosophers, consigned to the government of a power denominated VITALITY. But we are not told by what law this power maintains its sway. Now this is the very

thing we are in quest of, and we must still insist upon having those laws classed or explained. If we say that this and that and every composition and decomposition, that is perpetually going on in living bodies is the effect of vitality, and stop there; it seems to me that this mode of philosophising, partakes much of the peripatetic school of antiquity. This vitality savours very much of the occult qualities of Aristotle. To make myself understood, the great author of our being has formed the various organs of our bodies, for various purposes. The lungs to breathe; the stomach for digestion; the liver for the secretion of bile. Now supposing air to be presented to the lungs by respiration, they possess a relation to, or an affinity for, a certain portion of the oxygen of the atmosphere; they therefore combine with that portion and pass it on to the blood, now flowing through them. Another portion of the oxygen combines with another kind of matter called carbon, for which the proper organs have a repulsion; call these organs if you please secreting organs. This carbonic acid now formed, along with the whole of the nitrogen inspired, is thrown off. This closes the chemical process, so far as the air used in respiration is concerned. But the moment the nitrogen and the newly formed carbonic acid are completely expelled from the mouth, a mechanical principle begins to operate. The carbonic acid which is heavier than atmospheric air falls down, and the nitrogen which is lighter than atmospheric air rises up, and leaves a free passage for an uncontaminated portion of air to enter the lungs. Minute observations of this kind on nature make up philosophy. They have a most powerful tendency to impress the elevated mind, with just notions of the œconomy, wisdom and power, of the great hand which has put together this stupendous frame of things; and the study of the works of nature affords the most delightful gratification.

> "Nature exhaustless still, has power to warm,
> "And every change presents a novel charm."

But to proceed. Take the liver; its office is to secrete bile. Does the liver create the bile? or does it do any thing more than attract, and connect the approximate and ultimate elements of that fluid, which are presented to it in the course of

circulation. Now who does not know that what is called secretion, is a vital act, that is, that it is the act of a living being. But who is prepared to say that the great author of our being, has not so ordered things, that the blood is carried into the liver in a state peculiarly adapted to the formation of bile, the result of the peculiar structure, length, and arrangement of the vessels carrying it, and that the arrangement of the vessels which constitute the organ, is peculiarly adapted to allow the elements of the bile to separate from the general mass, and reuniting to form the fluid; or who can prove that the same repulsion does not exist between that organ and the matter of urine, that does between two bodies similarly electrified?

One of Newton's laws of philosophizing was, "that similar effects ought to be ascribed to similar causes." Let us exemplify it. We will put into a confined portion of atmospheric air, any small animal. At first it breathes with ease. At every respiration a portion of oxygen disappears. In a few minutes the animal labours for breath. In a few minutes more it is in convulsions, and presently it dies in great agony. You now analize the air in the vessel, and you scarcely find the trace of oxygen in it. We take a similar portion of atmospheric air. We introduce into the vessel some substance which will decompose the air, and combine with the oxygen. We now introduce a similar animal into the vessel. It dies as instantly as if you had poured hydrocyanic acid into its mouth, and in convulsive agony, as did the first animal. Are both these chemical effects? Or are either of them such?

The truth is, that it is in the widely extended field of animated nature, that chemistry exerts its ever varying and almost unlimited power. The oak was a twig an hundred years ago. Upon this twig the light of heaven was poured. That twig possessed the power of decomposing the light itself. Upon it fell the rain, and the winds. It, in its small, but powerful laboratory, manufactured both to its own purposes. The soil itself was made to yield up its fatness, and now it stands the glory of the forest.

The unorganized atoms of matter that descended into the womb of the mother, is presently endowed, by the al

zing power of the creator with life. This life is sustained for a time by its connexion with the parent. Presently its organs are developed, and it sees the light and breathes the air. Anon it is a man, and now consumes forty-six thousand cubic inches of oxygen per diem; and decomposes about one hundred and twenty-five cubic feet of air in the same time and renders it unfit for the support of animal life. This contaminated air passes on to the next vegetable, and is again regenerated. Thus the animated and vegetable creation, mutually sustain each other.

Volumes for aught I know, have been written upon what philosophers call the vital principle. You would sometimes think it even the soul of the universe. Always it is represented as above the ordinary principles of science in its energies. But I am afraid it is a phrase without a meaning. At any rate on this subject I profess the most profound veneration for the philosophy of Paul. "It is in God that we live and move and have our being."

Thus we have endeavoured to trace some of the effects produced upon the air by respiration. In a subsequent paper we shall endeavour to trace some of the effects produced upon the animated system in general, and especially the blood by the same process.

ART. VI.—*A case of Purpura Hæmorrhagica, with observations.* By LUNSFORD P. YANDELL, M. D. of Murfreesborough, Tennessee.

Miss G. daughter of a respectable farmer of this vicinity, aged about eighteen years, of a stout frame, and robust habit, was attacked on the 15th of January, 1827, with pleurisy, blended with peripneumonic symptoms. The attack being violent, an energetic practice, consisting of venesection, cathartics, and nauseating doses of antimony, was resorted to. It was found necessary to repeat the bleeding more than once, and calomel, in ten grain doses, was given for several nights in succession, followed by saline purgatives next day. Blisters and diaphoretics succeeded, in due time, and the disease appeared to be

the treatment.

But on the fifth day of her indisposition, the patient experienced an attack of diarrhœa, by which she was alarmingly prostrated. It yielded, however, in a few days, to opium and acetate of lead, conjoined with the compound powder of ipecacuan; and by the use of the carbonate of ammonia she was, again, speedily convalescent.

On the 30th we heard from her, at which time she was considered cured. We saw her, incidentally, on the 31st, she was engaged in light manual labour, but she still experienced some pain in the breast, slight cough and dyspnœa. Believing that some vestige of the disease, in the shape of sub-acute inflammation still remained, we ordered her a grain of calomel, with a fourth of a grain of opium every night on going to bed, with a view of producing an alterative effect.

We left our patient hoping to hear no more of the case. But the worst was yet to follow. On the 5th of February she was attacked with hæmorrhage from the nose and gums, which resisting all the domestic remedies of the family, caused us to be called on the night of the 11th. When we arrived at her bed side we found her prostrated to the lowest point—her countenance exsanguinous and sunken—her voice weak and tremulous—pulse extremely frequent and scarcely perceptible—the hæmorrhage from her nose and gums still in progress. In the course of the day, upon a slight muscular effort, she had once experienced syncope.

Upon examination we found her extremities covered with petechiæ, and were informed that they existed on other parts of the body. They were to be seen lining the tongue, gums, and fauces. Blood came, occasionally, from the ears, and from the nostrils it fell in drops without intermission. It was ejected from the mouth with the saliva.

The whole class of vegetable and mineral styptics had been gone over without effect—the bleeding continuing, and the patient in the most imminent peril.

Without loss of time we commenced with bark and the sulphuric acid, in doses as large as her stomach would bear. A gargle made of borax, and cold cloths to the back of her neck, were conjoined, with temporary advantage.

In a few days, under this course, the hæmorrhage ceased—the vital powers rallied—the petechial spots disappeared; and considering her extreme debility, she enjoyed a rapid convalescence, and is now in the enjoyment of good health.

REMARKS.

This case fell under our care during the first winter of our professional labours, when we had enjoyed little experience in the treatment of inflammatory affections of the breast. In the management of it, it is possible we committed errors. Cathartics were possibly administered too freely in the acute stage of the complaint. The diarrhœa, with the consequent extreme prostration, was probably produced by this cause.

It is our opinion that the use of the mercury, in the subsequent treatment, intended to remove sub-acute inflammation was judicious; although it was blamed with the whole train of disastrous consequences which ensued. Of all the articles of the materia medica it is known to possess the most sovereign controul over inflammatory affections of a chronic character.

It is however possible that the calomel was the cause of the purpura. We cannot calculate for those inscrutable attributes of the animal œconomy—idiosyncrasies. They are ascertained only by experience, which, in these cases, comes always too late.

Although clearly indicated in the case before us, it is still possible, that owing to some unforeseen peculiarity of the patient's constitution, the mineral to her was poisonous. No ptyalism was produced, but the bleeding took place in about five days after she commenced the use of the medicine. Dr. Bateman, in his synopsis, mentions the case of a boy who died of purpura hæmorrhagica—the disease coming "on during a severe salivation, which had been accidentally induced by a few grains of mercury, given in combination with opium for the cure of rheumatism."

If the calomel was not to blame, what produced the disease? We would answer a congestion of the lungs. Symptoms of pulmonary engorgement continued to exist after the disease appeared to be cured—after the patient had resumed her ordinary habits and occupation.

Laennec, in his work on the chest, speaking of the diagnosis of peripneumony, remarks, "it often happens that persons affected with peripneumony, after the use of antiphlogistics, appear almost cured for a few days: the fever and pain go off, the cough becomes less frequent, and the expectoration trifling; the strength and appetite return; but we learn by the cylinder and percussion that the pulmonary engorgement remains quite undiminished. Accordingly, in such cases, we find that after a deceitful convalescence of a few days, or even weeks, the exhaustion, with cerebral congestion, and dyspnœa, carries off the patient."

We have submitted this case, with our treatment in it, to the public—subjecting ourselves thus to the scrutiny and criticism of our professional brethren—with a hope that it may reflect some light on the cause and character of this singular and obscure disease. We do not pretend to infallibility, and are conscious that fault may be found with our treatment. We believe, however, that it was correct; at least the patient recovered.

It is only by collecting facts and making from them legitimate deductions, that we can hope to improve the science of medicine.—"Nunquam aliquid magni facias ex mera conjectura aut hypothesi."

ART. VII.—*Case of Dyspepsia.* By JOHN A. TURNER, M. D. of Salem, Fauquier County, Virginia; communicated in a letter to Alfred T. McGill, M. D. of Winchester, Frederick county, Virginia.

In May 1826, I was requested to visit Mr. J. F. a gentleman of twenty-five or thirty years of age, of melancholic temperament.

He had been for several years, employed in teaching a country school; but he was not sensible of any disturbance of his health, from his sedentary pursuit, prior to February 1825.

On the 21st of that month, he left home as well as usual, to ride about thirty miles. It was a cold, snowy day. Whilst riding along, he was attacked suddenly with a violent palpitation of the heart, succeeded by a sense of numbness over the whole body. He could scarcely move the tongue in attempting to articulate; the hands and feet were somewhat paralyzed; and he experienced a remarkable sense of coldness in the stomach and bowels, which was greatly increased by swallowing a very small quantity of cold water. He had breakfasted on the morning previous to this attack, on fresh fish.

The paralytic symptoms, in a short time disappeared; but from the time of the attack, the digestive power was greatly impaired.

He had scarcely any appetite, experienced great oppression from the smallest quantity of solid aliment received into the stomach, and suffered excessively from flatulence. His flesh and strength now began to decline rapidly. The sense of coldness in the stomach and bowels continued, and was so much increased by cold water, that he drank none for several months.

On the 23d of February, two days after his attack, he consulted Dr. W. who gave him two or three mercurial cathartics, at short intervals, and subsequently prescribed pills of rhubarb and asafœtida, without much benefit.

In April following, I visited him in consultation with Dr. W. We found him suffering with loss of appetite, nausea, gastric oppression, flatulence, great lassitude and want of energy, with extreme depression of spirits.

We recommended two or three emetics of ipecacuanha at intervals of three days, to be followed by sulphate of iron and elixir of vitriol, with exercise and cold bath. By this treatment he seemed to improve, and gained strength enough to ride twelve or fifteen miles.

On the 21st June, the morning being very warm, he fatigued himself at work and was again attacked with numbness. On the following day, he took an emetic of ipecacuanha, and recommenced the use of the tonic, which was prescribed previously. On the 25th of the same month, after dining on lamb, he had an attack of numbness more violent than any of the

preceding. Dr. W. was present, and gave him spt. corn. cerv. and ether. He now continued to use the solution of iron in elixir of vitriol until fall; but his emaciation progressively increased, until the weather became cool, when he again recruited a little.

In December of the same year he again grew worse, and continued to decline until the 10th of May 1826, when I was requested to attend him.

His appearance was now indicative of extreme debility. He was scarcely able to walk across the floor of his room, and frequently felt pain when in the erect posture. The incapacity for mental exertion was so great, that an attempt to read or write, gave him violent head-ache, with a sense of sinking, compelling him to lie down. He suffered so much from oppression after taking a few mouthfuls of food, that he felt an unwillingness to eat any thing at all. He was greatly distressed with flatulence; but what is very remarkable, his bowels were nearly as regular as when in health. The skin was dry, shrivelled, and scurfy, and he complained of its exhaling an odour like that of the African.

Thinking, from my previous impressions, that this gentleman could not bear evacuation of any kind, I commenced the treatment with carb. of iron, solution of the sulphate of iron, chalybeate wine and other tonics successively. I at the same time prescribed the warm bath twice or three times a week, with frictions of finely pulverized salt every day, to improve the condition of the skin.

18th May. He complains much of giddiness and some uneasiness of the head, with entire incapacity for mental exertion. Suspecting, from the manner in which the case commenced, that there might be some primary affection of the brain, giving rise to the loss of tone in the stomach, in common with the other transient paralytic symptoms, and the condition of the system still seeming to prohibit evacuation, I determined to try the effect of counter-irritation over the cervical vertebræ—with this view I directed tartar emetic ointment to be rubbed on twice a day until the eruption appeared. The eruption appeared on the tenth day after the use of the ointment was com-

menced, and the neck continued sore for six months, but I was not able to observe any effect from it.

The tonic treatment was continued until the first of June, with the warm bath and frictions. The skin had now greatly improved; it was soft and lively instead of being harsh and scurfy, and it had entirely lost its disgusting odour; but my patient was evidently weaker and more emaciated, being now unable to walk without assistance.

On the 7th of June, after having had some conversation with my friend Dr. Cooke of Winchester, I determined to make trial of the mode of treatment advised by him, although I still thought that my patient's case called loudly for tonic, rather than evacuating remedies. I directed him to take three of the following pills every evening, viz.

R. Calomel. Aloes Socot.
Pulv. Rhei, aa. grs. 25. M. F. pill. 20.

These produced three or four dark and consistent discharges on the following morning. This prescription was continued without any very material change, until the 26th of June. The discharges were generally consistent and dark, though they were occasionally serous and of lighter colour. At this time, he began to complain much of acidity, which he had not done before, and seemed more distressed with flatulence and oppression: I prescribed the ley of hickory ashes and soot, which afforded temporary relief. I now thought of combining a tonic with the purgative, and struck upon the following.

R. Pulv. Rhei 40 grs. Aloes Socot. 20 grs.
Ipecacuan. 15 grs. Sulph. Ferr. 10 grs.
M, F. pill. 20.

Three of these pills taken at bed time, generally produced two or three discharges next morning. He continued these pills, three every evening, until October, when he commenced, taking them every other evening. Their use every other evening was continued until January, when they were discontinued. During the whole treatment, as well whilst he was under the tonic plan, as after the commencement of the purgative course, his diet consisted of milk and mush or chocolate, with an occasional allowance of chicken at dinner. He used

scarcely any drink except milk, water being disagreeable to him.

For the purpose of giving a better view of the improvement of his case, under the tonic and purgative course, I have set down from a note-book kept by the patient, the gradual increase of his weight. On the 1st July, four days after he began to use this combination, he weighed 115 pounds; on the 3d of the same month, 116; 5th, 117; 10th, 118; 24th, 119, and was able to walk, for the first time for nearly two months; 26th, 120; 29th, 121; August 10th, 126; 24th, 127, and was able to ride on horseback; 9th September, 128; 14th, 129; 18th, 130; 25th, 131; 11th October, 130; 19th, 140; 9th November, 143; December 2nd, 148; 20th, 151; January 6th, 1827, 155. Since this date he has continued to enjoy his usual health, but he has not ventured to depart from the rule of diet, which confined him to milk and the white meats, with corn bread or mush.

REMARKS.

The practice alluded to in the above communication, consists in producing two or three copious but consistent discharges from the bowels every day. This is in most cases best effected by such a compound as the one first mentioned by Dr. Turner. Half the quantity of calomel however, is sufficient in general to effect the purpose, and is not apt to affect the mouth. The pill commonly used by the writer is the following, the medicines being mixed with a few drops of water alone.

R. Aloes Socot. Rh. pulv. aa. grs. 48,
Cal. grs. 24, M. F. pil. 24.

It is indispensable that the discharges be consistent; watery thin discharges are decidedly injurious. The latter are produced not only by the more active cathartics, as jalap, scammony, &c., and by the saline cathartics, as the sulphate of magnesia, but by too large a dose of the compound above recommended. Thus, if two pills produce two or three copious consistent passages, four will in the same patient generally cause them to be too serous. In some instances it is necessary to reduce the dose to one pill or half of one, or even to leave out the rhubarb altogether, in order to obtain consistent passages.

This practice was adopted by the writer a number of years since, in consequence of its being a legitimate inference from the theory he entertains of the nature of dyspepsia, that such evacuations must be beneficial. The practice has been decidedly successful.

In the case stated above, it will be observed that the discharges about the 26th of June were occasionally serous and light coloured; at which time the patient began to complain of acidity, &c. Dr. Turner then thought it advisable to unite a tonic with the cathartic.

With respect to the appearance of acidity, or of any other single symptom, it may be observed that in the course of the successful treatment of a case of dyspepsia, there will be moments in which the symptoms will be more severe than they have been for a few days previous, and times when symptoms not before observed, will appear. If the amendment is on the whole sensible and steady, the mode of treatment is evidently proper, and we should persist in it.

It may also be observed that the pill, which in the above communication is called a compound of a tonic with a purgative, had precisely the effect desired from the pill of rhubarb, aloes and calomel. With regard to the tonic effect, little beneficial influence ought to be attributed to a grain and a half of the sulphate of iron once a day, which is the quantity contained in three of the pills mentioned as being last advised, when we consider how little good effect was produced by the ample exhibition of tonics mentioned in the forepart of this valuable communication. C.

Art. VIII.—*Case of Hydrothorax.* By Hugh Holmes McGuire, M. D. of Winchester, Frederic county, Virginia.

A gentleman from the State of Mississippi, had in the winter of 1823 an attack of asthma in Washington City, from which he did not perfectly recover; having during the succeeding spring and summer occasional attacks of difficult breathing. In the fall of 1824, he had the yellow fever in Natchez, from

which he recovered; but the difficulty of breathing still continuing, his physicians called it hydrothorax and advised calomel, squills, and digitalis in equal quantities, in three grain doses. This medicine operated actively on his bowels and relieved him very much; but affected his sight to such a degree that he was not able to read, and with difficulty could write.

After discontinuing this medicine for six weeks, he relapsed into his former situation, when he was advised to take tincture of digitalis in doses of eight drops, and a pill of calomel and squills of a grain each, night and morning. Not being relieved by this treatment, he determined to try the effect of a sea-voyage by New-Orleans to New-York. He continued to get worse upon his passage, and was so weak when he arrived in New-York, that it was necessary to carry him from the ship to his lodgings. He remained in the city for two weeks, and consulted some physicians but was not relieved. He then travelled to Philadelphia and consulted an eminent physician of that city who had him cupped on the breast, gave him Tinct. Myrrh. in doses of ten drops three times a day, and a wineglassful of lime-water every morning, and advised the use of charcoal to correct the offensiveness of his passages. He was however not benefitted by this treatment, and after remaining two weeks in Philadelphia he went on to Baltimore, where, being unable to travel, he remained ten or twelve days, and then by stages of ten or twelve miles a day reached Winchester.

His situation was now truly deplorable. He had not been able to sleep in a recumbent posture for seventy-three nights, nor could he lie down until day-light. He had great oppression of his breast, difficult respiration, made constant efforts to inhale air; his legs and feet were much swollen, and he was excessively emaciated; his urine was diminished to two gills in twenty-four hours, and was thick and high-coloured. These were accompanied by dyspeptic symptoms, as acid eructations, pain in the epigastrium, constipation of the bowels, constant thirst, &c. His pulse was slow, tense, and full.

His situation was such that I could scarcely expect to cure him by any treatment; but thought the only plan of relieving him from his present distressed situation was active depletion.

Accordingly I took from him twenty ounces of blood, and gave him four pills of calomel, jalap and scammony.

Next morning I found he had slept unusually well: the pills had commenced operating about four o'clock in the morning; the discharges were dark-green, consistent, and very offensive. The oppression was much relieved, together with the dyspeptic symptoms, and his urine was more copious. I gave him four more pills, and repeated the dose at twelve o'clock, which operated in the evening actively, bringing away large quantities of consistent, offensive matter with scybala. This course of active purging was continued for ten days with rapid amendment and increase of strength; when by eating imprudently, he produced an irritable state of his bowels, which made it necessary to suspend the medicine a few days. I did not find it necessary to continue this active medicine afterwards, but used instead of it, pills of rhubarb and aloes. His passages during the purging became less offensive and dark, his breathing free, and every symptom of his disorder disappeared.

ART. IX.—*Case of Diabetes.* By CHESTERFIELD L. WILCOX, M. D. of Clarksville, Tennessee.

THE subject of the following communication is a large and corpulent man of a sanguineous temperament, and weighs, when in good health, about two hundred pounds: he is thirty-five years of age: his habits are those of active life with moderate labour: he lives plentifully, and from this circumstance, as is too often the case, he indulges himself in the habitual use of spirituous liquors, but not to the degree of intoxication. He lives in a section of country very rich and fertile, remarkably level, and interspersed with numerous marshes; the inhabitants are very much afflicted with intermitting fever, and scarcely a season passes, except there be an unusual quantity of rain, without an epidemic of a bilious character.

In August 1826 he suffered much from a tertian intermittent, which he suffered to run an almost uninterrupted course until

the middle of September, when he took an active purgative of calomel and jalap, which operated freely. After the operation of the cathartic, he made a liberal use of the bark, which speedily checked the disease, but it returned in the month of October, in the form of a quartan fever. The disease continued in this form with occasional intermissions until February, when it was much aggravated. He now became very much alarmed at his situation, and called in medical aid. An active cathartic was prescribed, which relieved the urgent symptoms. A consultation being held on his case, he was advised to take a pill composed of one grain of opium and a quarter of a grain of tartarized antimony. It was administered half an hour before the time when the chill was expected, and to use his own words, "prevented the ague." He was advised then to make a liberal use of a bitter compound of columbo, gentian, and aloes.

A few days after he commenced the use of this medicine, the patient informed me he began to urinate in an unusual quantity, and continued to do so for several days without intermission. On consultation with his physician he was again advised to continue the tonics. It gradually became less and less for four or five days, and his health became as good as it had been during the winter.

About the middle of March, the quartan fever again returned, but was again checked by the opiate. The urine was immediately increased as before, only in an aggravated form, continuing four or five days and ceasing. After this period until I saw him, the quartan fever continued quite regular, with an increased discharge of urine lasting two and sometimes three days in every week. The amount of urine discharged at each recurrence was sometimes enormous.—In June when I was consulted, he was discharging urine of a whitish-yellow colour, of a sweetish taste, and he informed me it had been so ever since the increased secretion first made its appearance. There was an unremitting dull pain in the lumbar region; but he stated that for some time previous, the pain was severe only during the discharge; and when it ceased, he was always left with a great sense of weakness, amounting occasionally to an

inability to stand. There was general debility, and a great sense of fatigue on slight exercise, which he overcame as much as possible, having been advised by his former physician to take as much exercise as he could bear. His pulse was slow and feeble; his tongue somewhat furred; his appetite tolerably good; his bowels most commonly costive, but sometimes loose; and his countenance formerly ruddy was now pale and sallow.

Under these circumstances I prescribed, after consulting my preceptor, a dose of calomel and jalap which operated freely: on the second day he took nothing, but on the third I gave him another mercurial cathartic, which brought off dark bilious stools. I then prescribed the bark, with eight grains of the blue pill on going to bed, and quickened its action with a small dose of epsom salts, which produced two and sometimes three passages daily. As I intended to produce a gentle ptyalism, after the eighth day I omitted the salts and cinchona; but at this time the blue pill operated as freely as the salts and the pill together did in the commencement.

On the seventh and eighth days, the urine was manifestly less. His gums became gently sore on the twelfth day. Under these circumstances, both my patient and myself were induced to continue the plan; and to keep off excessive salivation, I again gave small doses of salts, which produced three and sometimes four passages daily. Under this plan of treatment, he continued to recover rapidly until the twenty-fifth day; at which time the urine was about its natural quantity. I discontinued the blue pill, and gave him some pills composed of equal quantities of aloes and rhubarb to keep up the discharges, which were perfectly natural. The salivation went off in about a week, and my patient was well. The disease had not returned in September last, at which time he was as corpulent as when he was first attacked, not the slightest symptom of the disease remaining.

ART. X.—*Florula Lexingtoniensis, secundum florendi ætatem digesta; or a descriptive Catalogue of the Phænogamous plants indigenous to this portion of Kentucky; arranged in the order of their periods of flowering.* By CHARLES WILKINS SHORT, M. D. Professor of Materia Medica and Medical Botany in Transylvania University.

FASCICULUS I.

For February, March and part of April.

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1. GENUS. ULMUS. L. (*Elm.*)

(*Derivation*—an old Latin name of obscure Etymology.)

Class 5th. PENTANDRIA—Order, DIGYNIA.

Generic Character. *Calyx* campanulate, 4 or 5—cleft. *Fruit a Samara*, compressed, encompassed by a membranaceous, alated border. *Stamina* varying from 4 to 8.—*Nuttall.*

Species 1st.—ULMUS AMERICANA. *White Elm.*

Specific Character. *Branches* recurved, smooth; *Leaves* unequal at base, serratures hooked, acuminate; *flowers* pedicillate; *fruit* fimbriate.

Observations. A forest tree which is very generally met with throughout the United States, from New-England to Carolina; but perhaps in this latitude, or in the more immediate vicinity of the Ohio river, it attains its greatest perfection. The Elm is particularly interesting from the circumstance of its being the earliest flowering tree in this country. In ordinary seasons its blossoms appear towards the middle or latter part of February, and on some occasions as early as the first of that month. The Elms in this neighbourhood are the favourite habitations of the missletoe, (*Viscum verticillatum*) whose clusters are so densely interposed among the branches of almost every Elm as to give to this tree a dusky verdure throughout the winter.

"There is a *variety* of this Elm with red branches, another with white, and a third more pendulous whose leaves are said to be smoother." *Smith.*

Species 2nd. ULMUS FULVA. *Slippery Elm.*

Sp. Ch. *Leaves* oval oblong, with a very long acumination, pubescent on both sides; *buds* tomentose, with a thick, tawny wool; *flowers* sessile.

Obs. The slippery Elm has almost disappeared from the forest around Lexington in consequence of its destruction by cattle. In the more inaccessible situations among the cliffs of Elkhorn and the Kentucky river, it is occasionally met with, being readily distinguished from the preceding species, by its smaller size—its larger and more scabrous leaf. It blooms a few days later, but before any appearance of foliage in the tree. The inner bark is medicinal, being mucilaginous and demulcent.

Synonyms. U. Rubra. *Mich.* U. Campestris. *Walt.*

2. GENUS. CORYLUS. L. (*Hazel.*)

(*Deriv.* Greek. *Korys*,* a cap, or helmet—the fruit being invested by the calyx. *De Theis.*)

Class 21st. MONOECIA—Order, POLYANDRIA.

Gen. Ch. *Male florets.* *Ament* imbricate. *Calyx* a scale. *Corolla* none. *Stamens* about 8. *Female florets.* Calyx 2—parted, torn. *Corolla* none. *Styles* 2. *Nut* ovate, surrounded by the persistent calyx.

Species 1st. CORYLUS. AMERICANA. *Walt.*

Sp. Ch. *Leaves* nearly round, cordate, acuminate; *calyx* of of the fruit larger than the nut with the border dilated, many-cleft.

Obs. The Hazel bush although originally a native of this country, is no longer found growing wild in this immediate neighbourhood, yet it is frequently met with in gardens and shrubberies. In the western part of the state it abounds, often forming on the richest barrens almost impenetrable brakes. In these situations the bush attains the greatest perfection; its stems often measuring near the root more than an inch in diameter, rising 10 or 12 feet high, and bearing a profusion of large well-flavored nuts. The male flowers, formed during the preceding autumn, are evolved into blossom during February, in long pendent catkins, from the smaller branches; while the female flowers, much less conspicuous, occupy the extreme ends

* For want of Greek types, the Latin italics are used to explain derivations from the former language.

of the twigs. The fruit is too well known to need description. They ripen in September.

3. Genus. CARDAMINE. L.

(*Deriv.* Diminutive of *Kardamon*, the greek name for water-cress.)

Class 15*th.* *TETRADYNAMIA—Order, SILIQUOSA.*

Gen. Ch. *Pod* long, opening elastically, with the valves revolute and equal with the partition. *Stigma* entire. *Calyx* expanding at the top.

Species 1*st.* Cardamine Virginica?

Sp. Ch. Small, *stems* partially decumbent: *leaves* pinnate, leaflets lanceolate somewhat auriculate; *pods* long, erect, strait.

Obs. This little plant excites no other interest than that arising from the early period at which it blooms; being here, as the *Draba verna* in the Eastern states, the earliest harbinger of spring. Root-leaves spread into a circle and densely aggregated, stem-leaves fewer and smaller, all pinnated. In the centre of its radical leaves, its minute white flowers first appear towards the last of February, and as the plant progresses in growth, the stems arise to the height of 6–8 inches, branch off and become somewhat procumbent; the flowers are succeeded by pods (siliques) 1 inch long.

In cultivated fields abundant: flowering from middle of February.

Syn. Nasturtium, bursæ pastoris folio. Pluk.

4. Genus. STELLARIA. L.

(*Deriv.* from the latin *Stella*, a star; the corolla of bifid petals resembling a star.)

Class 10*th.* *DECANDRIA—Order, TRIGYNIA.*

Gen. Ch. *Calyx* 5-leaved expanding; *petals* 5, two-parted. *Capsule* ovate, 1-celled, many seeded; Summit 6-toothed.

Species 1*st.* Stellaria Media. *Chickweed.*

Sp. Ch. *Leaves* ovate, smooth; *stems* procumbent, with an alternate, lateral, hairy line.

Obs. An humble, unobtrusive annual plant, frequently flowering in this section as early as the 1st of March, and sometimes, in favourable seasons and situations, it is found in bloom in February. From that time its flowers are met with throughout the year. Whether native or introduced it is now found in every part of the continent. In this locality it prefers rich woods or cultivated places, frequently covering patches of considerable extent.

Syn. Alsine Media. L.

5. Genus. PACHYSANDRA. *Michaux.*

(*Deriv.* From the greek, *pachus*, thick, and *aner*, a male, in allusion to the thickness of the stamens.)

Class 19*th.* *MONOECIA*, *Order.* *TETRANDRIA.*

Gen. Ch. *Calyx* about 4-leaved. *Corolla* none. *Filaments* subclavate. *Styles* 3. *Capsules* 3-horned, 3-celled: cells 2-seeded.

Species 1*st.* Pachysandra Procumbens.

Sp. Ch. *Stem* low and procumbent, *leaves* alternate, pubescent, stalked, entire at base, bluntly dentate towards the point; *spikes* nearly radical, lower part feminine; *flowers* bracteate.

Obs. The only species of this genus as yet known is the present one. It is rare in this neighbourhood, being only occasionally met with in that part of Fayette county bordering on the Kentucky river. In the western part of the state, and particularly on the rocky banks of Green river and its tributary branches it is profusely abundant. Its leaves partially retain their verdure throughout the winter, and towards the latter end of February or beginning of March its spikes protrude bearing a number of small inconspicuous flowers, for the most part distinctly male and female but sometimes hermaphrodite.

6. Genus. ERIGENIA. *Nuttall.*

(*Deriv.* Greek. *Erigenia* a name of Aurora, the harbinger of day or the spring; in consequence of its flowering so early in the season.)

Class 5*th.* *PENTANDRIA—Order*, *DIGYNIA.*

Gen. Ch. *Calyx* none. *Corolla* uniform. *Petals* obovate, spreading, entire. *Styles* persistent, subulate, very long. *Fruit* oval, somewhat laterally compressed. *Seed* gibbously convex, marked with 3 striæ; commissure narrow, immarginate, flat. *Involucrum* none.

Species 1*st.* ERIGENIA BULBOSA. *Nuttall.*

Sp. Ch. *Root* a small globular tuber. *Caulis* simple, bifid, rarely trifid. *Leaf* solitary radical, lateral, 3-partite, segments multifid. *Scapes* furnishing a similar involucrate leaf. *Umbels* terminal from 3 to 5-flowered, flowers stellate.

Obs. This is the first of the umbelliferous tribe to bloom in this vicinity, and is met with most frequently in the rich alluvions of our larger streams. It is a very small plant conspicuous only from its precocity; its small white flowers appearing among the fallen forest leaves from the 1st to 15th of March, before its own leaves are fully evolved. The anthers are of a dark purple—when fully mature the whole plant does not exceed 6 inches in height.

Syn. Sison bulbosum—*Mich.* Hydrocotyle composita. *Pursh.*

7. GENUS. HEPATICA. *Willdenow.*

(*Deriv.* Greek, *Hepar;* the liver; the lobes of its leaves being supposed to resemble those of the liver.)

Class 12*th.* *POLYANDRIA—Order, POLYGYNIA.*

Gen. ch. *Calyx* 3-leaved. *Petals* 6 to 9.—*Seeds* naked.

Species 1*st.* HEPATICA TRILOBA. *Liver-wort.*

Sp. ch. *Leaves* cordate at base, 3-lobed, lobes entire, *scape* 1-flowered.

Obs. One of our most beautiful and earliest flowering plants, often blooming before its leaves have come up, and while the ground is yet covered with snow—The root is fibrous and perennial—Leaves all radical, on foot-stalks 3–6 inches long; flowers numerous, issuing from the root on peduncles 2 or 4 inches in length, for the most part of a purple colour, but rarely white. The whole plant when young is covered with fine silken hairs—when old, the leaves lose in some degree this appearance and become thick and coriaceous, they are partially sempervirent, and occasionally assume a dark purple hue.

Although the present is the only species of *Hepatica* known, yet two distinctly marked *varieties* occur—the one with obtuse-lobed leaves, the other having the lobes acute: the latter is more commonly met with in this section of country. Though rare in this immediate neighbourhood, it is sometimes met with on the rocky hill sides, bordering the Elkhorn, and more frequently among the cliffs of the Kentucky river in rich soils. Some attention has lately been drawn to this plant in pectoral diseases; whether it possesses any virtues in such I am not prepared to say, but I should judge it to be at least innocent.

Syn. Anemone Hepatica—*Willd. Mich. and Linn.*

8. Genus. ARABIS. L.

(*Deriv.* An ancient Greek name of a plant; supposed to be a native of Arabia.)

Class 14*th.* *TETRADYNAMIA—Order, SILIQUOSA.*

Gen. ch. *Pod* linear, generally compressed, crowned with the sessile stigma, valves veined. *Seed* arranged in one row.—*Calyx* erect.

Species 1*st.* Arabis Rhomboidea.

Sp. ch. *Leaves* glabrous, rhomboidal, repand, toothed, the lower ones on long petioles; *root* tuberous.

Obs. Root a small tuber. Radical leaves few, roundish or sub-cordate, on slender flexuose petioles 3 to 6 inches long; stem-leaves of various forms; the lower on short foot-stalks and somewhat rhomboid, (whence the name of the species,) the upper sessile, narrower, acuminate and sparingly toothed. Flowers white or pale purple, about the size of those of the garden radish, in a terminal raceme, succeeded by linear pods on peduncles 1 inch in length. Found in moist rich woods, or on creek sides. Blooms about the 10th of March.

Syn. Arabis Bulbosa. *Muhl.*

Species 2*d.* Arabis Falcata. *Sickle-pod Arabis.*

Sp. ch. *Leaves* lanceolate, narrow at each end, remotely dentate, hastate-sessile, alternate; *siliques* pendulous, compressed, falcate.

Obs. Root perennial, fusiform-fibrous, stem from 1 to 4 feet high. Leaves alternate; those from the root spathulate, petioled: of the stem linear lanceolate, sessile, amplexicaule, hastate, irregularly dentate, 4 to 6 inches long. Flowers in

long terminal racemes. Corolla small, obscure white. Pods 2 to 4 inches long, linear, recurved, sometimes pendulous. Rocky shaded situations on North Elkhorn: flowers last of March and first of April.

Syn. Arabis canadensis. *Willd. Ell. Nutt.*

9. Genus. CLAYTONIA. *Gronovius.*

(*Deriv.* Named by Gronovius in honor of John Clayton, an eminent botanist of Virginia.)

Class 5th. PENTANDRIA—Order, MONOGYNIA.

Generic character. *Calyx* 2-leaved. *Petals* 5. *Stigma* trifid. *Capsule* 1-celled, 3-valved, 3 to 5-seeded. *Seeds* uniform. *Nutt.*

Species 1*st.* Claytonia Virginica. Gr.

Specific character. *Leaves* linear-lanceolate; *racemes* solitary; leaves of the *calyx* somewhat acute; *petals* obovate, retuse. *root* tuberous.

Obs. This delicate little plant adorns our meadows and pastures profusely in early spring. Several grass-like leaves arise in common with the stem, from a round small tuberous root. Stem-leaves two, opposite, linear, smooth, somewhat fleshy and connate at base. Flowers from 4 to 18, in a simple curved raceme which becomes erect and straight as the flowers are evolved; their colour is white or a delicate pink, marked with lines of a deeper rose colour. It blooms generally from the middle to the 30th of March.

10. Genus. THLASPI. L.

(*Deriv.* An old Greek word used by Dioscorides, to which he gives an obscure derivation.)

Class 14th. TETRADYNAMIA—Order, SILICULOSI.

Gen. ch. *Pod* emarginate, obcordate, many-seeded. *Valves* boat-shaped, keeled. *Ell.*

Species 1*st.* Thlaspi Bursa-pastoris. Shepherd's purse.

Sp. ch. Hirsute; *pods* deltoid, obcordate; *root-leaves* pinnatifid; *stem-leaves* saggitate and amplexicaule at base.

Obs. This little weed, although originally exotic, is now met with abundantly throughout this section, in common with

every other part of the Union. In early spring its lower leaves are used as greens; and about the 15th of March its minute, inconspicuous flowers appear, which are succeeded by a number of small obcordate silicles borne on a stem a foot or more in height: it continues blooming throughout the season, and is often met with in flower during the winter. Found every where in cultivated grounds.

11. Genus. ERYTHRONIUM. L.

(*Deriv.* Greek. *Erythros* red; in allusion either to the colour of the flower, which in some species is red, or to the purple stains on the leaves.)

Class 6th. HEXANDRIA—Order, MONOGYNIA.

Gen. char. *Calyx* none. *Corolla* campanulate, 6-petals reflected, and the 3 inner ones with a callous denture on each side near the base. *Capsule* superior roundish or eliptical, 3-celled.

Species 1*st.* Erythronium Americanum. *Dogs-tooth Violet.*

Sp. ch. *Leaves* lanceolate, punctate; *petals* oblong lanceolate, obtuse at the point; interior ones bidentate near the base; *style* club-shaped; *stigma* entire.

Obs. This plant, the first of the lilliaceous tribe to bloom in this neighbourhood, is readily recognised by its two leaves, which are radical, elliptic-lanceolate, somewhat fleshy, and beautifully marbled with green and brown. The *flower* is yellow, solitary and drooping, on a naked scape. The root a small tunicated, brown, ovate bulb, situated 2 or 3 inches beneath the surface of the soil. Whole plant from 6 to 10 inches above it. Found most generally on the rich alluvial bottoms of streams. Blooms about the 20th of March.

Syn. E. lanceolatum. Pursh—*E. Dens Canis.* Mich.

Species 2d. Erythronium Albidum. *Torrey.*

Sp. ch. *Leaves* elliptical-lanceolate, not punctate; *petals* linear-lanceolate, obtuse; inner ones without dentures, subunguiculate; *style* 3-cleft.

Obs. This plant I have heretofore been accustomed to regard as a mere *variety* of the former, differing from it chiefly in the colour of its flower which is bluish white; nevertheless I follow Dr. Torrey in considering it now as a distinct species,

although I have some doubts whether sufficient difference exists between them. The present species is more abundant in this neighbourhood than the yellow-flowered one, but they are found in common, affecting the same localities and blooming at the same time.

12. GENUS. CORYDALIS. *Ventenat.*

(*Deriv.* Gr. *Korydalos*, a lark: Larkspur, in reference to the spurred shape of its nectaries.)

Class 16th. DIADELPHIA—Order, HEXANDRIA.

Gen. ch. *Calyx* 2-leaved. *Corolla* ringent. *Filaments* 2, membranaceous, each bearing 3 anthers. *Capsule*, siliquose many-seeded.

Species 1st. CORYDALIS CUCULLARIA. *Dutchman's breeches.*

Sp. ch. *Scape* naked: *raceme* simple. *Spurs* 2, divaricate, the length of the corolla, style included: *root* bulbous. *Pers.*

This is one of the most delicate and beautiful plants of the country; its finely divided leaves, of a bluish green, are among the earliest vegetation seen in secluded rich situations among decaying logs, &c. Towards the 20th of March its flowers appear gracefully pendent from a naked scape which is generally nodding and 8 or 10 inches high. The flowers are white with a yellowish border, and are surmounted by two spurs. Its leaves are all radical and finely subdivided, two accompanying each flowering stem. The root is a granulated scaly bulb, a bulbous enlargement being produced at the base of the leaf, which is red or pink coloured.

Syn. Fumaria Cucullaria, *Willd. & Mich.*
Bicucullata Canadensis, *Marchant.*
Diclytra Canadensis, *Bosc.*

Species 2d. CORYDALIS FORMOSA.

Sp. ch. *Spurs* 2, slightly curved, obtuse; *scape* naked; *raceme* somewhat compounded; *stigma* 2-angled.

Obs. This is no less interesting than the preceding species, and, indeed, the delightful hyacynthine odour of its flowers gives to the present one an additional charm. The description given by Pursh is apt to mislead the student as he says the flowers are "a lively bright red." As I have seen them they have been universally of a pale purple or bluish white. It is found, in common with the former, on the precipitous banks

of water courses, in the rich soil among lime stone rocks, and is readily distinguished from its associate, by its more erect scape, single radical leaf, and by its root, which is a small round, yellow tuber, sometimes aggregated in considerable numbers. The leaves of the two species are very similar, and they flower at the same time.

Syn. Diclytra formosa, *Ell.* Fumaria—*Bot. Mag.*

Species 3*d.* CORYDALIS AUREA. *Golden-flowered C.*

Sp. ch. *Stem* branched, diffused; *leaves* bipinnate, leaflets divided, linear-lanceolate, acute; *racemes* leaning one way; *bracteas* oblong acuminate; *pods* linear, 2 to 4 times as long as the peduncle. *Spur* 1.

Obs. This species differs from either of the preceding in its more diffused and branching character, in the size and colour of its flowers which are small and of a bright yellow, surmounted by a single spur or nectary. It is, moreover, more abundant, and is sometimes found in cultivated situations among the grass &c. in fence corners. Its leaves appear very early in the spring and its flowers towards the 20th of March, continuing in bloom longer than either of the former.

13. GENUS. SAXIFRAGA. L.

(*Deriv.* Lat. *Saxum*, a rock, and *frango* to break; from its often growing in the clefts of rocks. *Dar.*)

Class 10*th.* *DECANDRIA—Order, DIGYNIA.*

Gen. Ch. *Calyx* 5-parted, persistent. *Petals* 5. *Capsule* 1-celled, many-seeded, opening between the persistent styles.

Species 1*st.* SAXIFRAGA VERNALIS. *Willd. Early Saxifrage.*

Sp. Ch. Pubescent; *leaves* oval, obtuse, crenate, dentate somewhat petioled; *stem* nearly leafless, paniculated; *flowers* nearly sessile.

Obs. Among the multiplicity of Synonyms by which this common plant is known in books of American Botany, I have been at some difficulty in selecting the most appropriate; but as the plant is by no means restricted in its *habitat* to Virginia, and as it seems to be the earliest flowering species indigenous to the United States, I have chosen to follow Dr. Bigelow in adopting Willdenow's name. The root is perennial; leaves mostly radical. Stem erect fleshy, hairy nearly destitute of

leaves, and when fully grown, in good soil, rising to the height of 12 or 18 inches. Flowers often appear by the 20th of March whilst the plant is but an inch or two high: they are small, white, clustered, nearly sessile, and continue unfolding for some weeks. Rocky situations near water courses.
Syn. Saxifraga Nivalis. *Muhl.* S. Virginiensis. *Mx. Pl.* S. Virginica *Bart. Dar.* &c.

14. Genus. URTICA. L. *Nettle.*

(*Deriv.* Latin *uro* to burn or sting, and *tactus* the touch.)

Class 21*st.* *MONOECIA—Order, TETRANDRIA.*

Gen. Ch. Male florets. Calyx 4-leaved. *Corolla* none.
Female florets. Calyx 2-valved. *Corolla* none—seed 1, shining.

Species 1*st.* Urtica Urens. *Small stinging nettle.*

Sp. Ch. Leaves opposite, cordate, somewhat 5-nerved, coarsely toothed, decussate: *spikes* by pairs, shorter than the petioles; *flowers* clustered.

Obs. Stem from 12 to 14 inches high, obtusely four-angled, branching from the root and semi-prostrate. Leaves more properly 3, than 5-nerved, sometimes purplish underneath, on petioles an inch long. Flowers small and greenish in axillary racemes, two in each axil, shorter than the petiole. Male and female florets intermixed. The whole plant is densely beset with fine hairs and stiff white prickles, which transmit a poisonous fluid when touched. Frequent in rich moist woods among decaying leaves, flowering in the latter part of March and after.

15. Genus. DENTARIA, L. *Toothwort.*

(*Deriv.* Latin. *Dens dentis*, a tooth from the tooth-like appearance of its root.)

Class 15*th.* *TETRADYNAMIA—Order, SILIQUOSA.*

Gen. Ch. Pod opening elastically. *Valves* without nerves, revolute. *Partition* somewhat fungous. *Stigma* emarginate. *Calyx* connivent.

Species 1*st.* Dentaria Laciniata.

Sp. Ch. Leaves ternate, leaflets 3-parted, segments lanceolate, toothed and irregularly notched.

Obs. This is the most showy of our tetradynamous productions, and when growing in good soil not too much shaded, its dense heads of white and purplish flowers, contrasted with the rich green of its verticillate leaves, make it a very pleasing object in early spring. The root is perennial, composed of small tubers, slightly connected together, and emitting numerous fine radicles—these tubers partake of the general properties of the class, being hot and pungent to the taste. Flowers last of March.

16. Genus. ANEMONE. L. *Wind-flower.*

(*Deriv.* Greek *Anemos*, wind from its blooming in boisterous weather.)

Class 12th. POLYANDRIA—Order, POLYGYNIA.

Gen. ch. *Calyx* none. *Petals* 5 to 15. *Involucrum* 3-leaved, distant from the flower. *Seeds* numerous.

Species 1st. Anemone Pennsylvanica? *Tor.*

Sp. ch. *Leaves* 3-parted; lobes oblong, incisely toothed at the apex; *involucrum* similar, sessile, bearing several pedicels, one of which is naked and 1-flowered, the others involucellate, *fruit* pubescent. *Torrey.*

Obs. I have ventured with some hesitation to affix a specific name to the present plant, since I have reasons to believe that it has been regarded by competent judges, to be the *A. Thalictroides.* From that plant, however, as commonly met with in the Eastern states, it differs essentially in its root, which is less fleshy and more fibrous,—in its leaflets which are not cordate but cuneiform at base, and irregularly 3—5-lobed at the apex—in its flower which is smaller, uniformly of five petals, one only opening at a time. I have questioned whether the present might not be the variety *Uniflora* of *A. Thalic.* of Pursh. It would seem to differ from the *A. Penn.* of Torrey, in the flower which he describes as being large and yellowish white. Found in abundance in woods, flowering from the middle to the last of March.

17. Genus. GLECHOMA. L.

(*Deriv.* an ancient name perhaps from the Greek *Glukus*, sweet or pleasant in reference to its odour. *Dar.*)

Class 14*th.* ***DIDYNAMIA—Order, GYMNOSPERMIA.***

Gen. ch. *Calyx* 5-cleft, subequal. *Anthers* approaching each other in pairs, each pair producing the form of a cross.

Species 1*st.* GLECHOMA HEDERACEA. *Ground ivy.*

Sp. ch. *Stem* procumbent radicating; *leaves* cordate-reniform, crenate.

Obs. A small procumbent plant, abundant on the alluvion bottoms of our creeks and rivers, and in the fence-rows of rich, cultivated fields. Flowers deep blue and strongly scented. Corolla double the length of the calyx, upper lip bifid, lower trifid, middle segment larger, emarginate and bearded internally: peduncles axillary, about 3-flowered, flowers in whorls. Though originally, perhaps, exotic, this plant seems now extensively naturalized in the U. States, being found abundantly in the middle and northern states. Blooms here towards the last of March.

18. GENUS. JEFFERSONIA. *Barton.* (*B. S.*)

(*Deriv.* named by Barton in honor of the late President Jefferson.)

Class 8*th.* ***OCTANDRIA—Order, MONOGYNIA.***

Gen. ch. *Calyx* 5-leaved, coloured, deciduous. *Corolla* of 8 petals, incurvately spreading. *Capsule* obovate, substipitate. 1-celled, opening below the summit by a lunate foramen. *Seeds* many, oblong.

Species 1*st.* JEFFERSONIA DIPHYLLA. *Bart.*

Sp. Ch. *Root* perennial, stemless; *leaves* conjugate or binate; *scapes* naked, 1-flowered; *flowers* caducous, white.

Obs. This is the only species of the genus, and is at this time exceedingly scarce in this locality. A few years since it grew abundantly on the south bank of *Royle's mill pond*, but is now only met with in the more secluded hill-sides bordering the Elkhorn, or on the cliffs of the Kentucky river. It grows in clumps; many leaves issuing together from a fibrous root, and supported on foot-stalks 5 or 8 inches long. The flowers appear about the 30th of March and are somewhat like those of the Puccoon, (*Sanguinaria C,*) though smaller; they are extremely short-lived, and so very caducous as to be preserved with great difficulty in an *Herbarium*.

Syn. Jeffersonia Bartonis. *Mich.*
Podophyllum diphyllum. *Linn.*

19. Genus. THALICTRUM. L.

(*Deriv.* Supposed to be from the Greek, *thallo*, to be green; from its verdant habit, *Dar.*)

Class 12*th. POLYANDRIA—Order, POLYGYNIA.*

Gen. ch. Mostly diœcious. *Calyx* none. *Petals* 4 or 5. *Stamina* very long. *Seeds* without tails, striate.

Species 1*st.* Thalictrum Dioicum. *Meadow ruc.*

Sp. ch. Flowers dioecious, *filaments* threadlike: segments of the *leaves* nearly round, cordate, obtusely lobed, glabrous; *pedunclcs* axillary, shorter than the leaves.

Obs. The season of its flowering throws some light on this otherwise obscure genus. The present is the first (with the exception of T. Anemonoides, more properly regarded a true Anemone,) to flower in the U. States. Root perennial. Stem herbaceous 12 to 18 inches high; leaves triternate, those from the root embracing the stem by a broad membranaceous expansion; leaflets slightly cordate at base, roundish, divided into from 3 to 7 obtuse lobes. Foot-stalks of the umbels shorter than the leaves, frequently extending and becoming compound and paniculate. Corolla small, dull-white colour; anthers yellow. Grows in rocky bluffs on water courses. Flowers last of March.

20. Genus. TRILLIUM. L.

(*Deriv.* Latin. *Trilix* triple; alluding to the prevalence of the number *three*, in the leaves and other parts. *Dar.*)

Class 6*th. HEXANDRIA—Order, TRIGYNIA.*

Gen. ch. Calyx 3-leaved, spreading. *Corolla* 3-petaled. *Stigmas* 3, sessile, recurved. *Berry* 3-celled.

Species 1*st.* Trillium Sessile.

Sp. ch. Flowers sessile, erect; *petals* lanecolate erect. *Leaves* sessile, wide, oval, acute.

Obs. This species of Trillium is easily distinguished from others of this locality, by its sessile flower. The root consists of a thick tuber, from which descend numerous radicles. Stem from 2 to 8 inches above ground, coloured and spotted, with small decaying sheaths at base. Leaves 3, at the summit of the stem, ovate, acute, entire, strongly marked with 3 veins and curiously spotted. Flower sessile, in the centre of the 3

leaves: petals 3, lanceolate, erect or connivent, dark purple. Calyx 3-leaved, spreading alternately between the stem-leaves. Grows in rich woods or grass grounds. Flowers last of March—April.

21. Genus. SANGUINARIA. L.

(*Deriv.* Latin *Sanguis* blood, from the colour of the juice of the plant.)

Class 12*th.* *POLYANDRIA—Order, MONOGYNIA.*

Gen. ch. *Calyx* 2-leaved, deciduous. *Petals* 8 to 12. *Stigma* sessile, 2-grooved. *Capsule* superiour, oblong, 1-celled, 2-valved, apex attenuated. *Receptacles* 2, filiform, marginal. *Nutt.*

Species 1*st.* Sanguinaria Canadensis. *Puccoon.*

Sp. ch. *Leaves* sub-reniform, sinuate, lobed: *Scape* 1-flowered.

Obs. No plant is more commonly met with in early spring, in this vicinity, than the puccoon, by which name it is here universally recognised. The flower-stalks appear above ground about the 1st of April, sheathed at base by an accompanying leaf, which unfolds itself after the flower has disappeared. Perhaps no wild plant better deserves cultivation than this, as "with little attention and care a beautiful variety with double flowers might be produced." The whole plant, but particularly the root, emits when wounded, an acrid, blood coloured juice, which is highly medicinal, being emetic, expectorant and escharotic.

It prefers rich, moist, shaded woods, and in such situations it is every where abundant in the spring, disappearing however entirely towards midsummer.

22. Genus. RANUNCULUS. L.

(*Deriv.* Latin diminutive of *Rana* a frog; from some fancied connexion between this plant and that animal.)

Class 12*th.* *POLYANDRIA—Order, POLYGYNIA.*

Gen. ch. *Calyx* 5-leaved. *Petals* 5, bearing near the base of their claw, a melliferous pore generally covered with a scale. *Seeds* naked.

Species 1*st.* Ranunculus Abortivus. *Small flowered crow-foot.*

Sp. ch. *Radical leaves* heart-shaped, crenate; *stem-leaves* ternate, or cleft into 5 or 3 linear lobes; branchlets about 3-flowered.

Obs. This species is easily distinguished from the following, which blooms about the same time, by its small flowers, and undivided radical leaves; these are heart or kidney-shaped, on petioles 2–4 inches long, which embrace the caudex by an expanded base. The stem-leaves vary considerably, the lower ones being irregularly subdivided into 5 lobes which are notched or dentated, and petiolated; the upper are ternate, linear and sessile. The root is fibrous. Stems erect, branching, and ultimately each branch bearing 3–5 flowers, which are small, pale yellow, on peduncles 2 to 1-2 inch long. Grows in woods and meadows. Blooms last of March.

Species 2d. RANUNCULUS FASCICULARIS. *Muhl.*

Sp. ch. *Root* very much fascicled; *leaves* ternate, subpinnate, glabrous. *Bart.*

Obs. This is the most showy of our Ranunculi; growing to the height of 18 or 24 inches and bearing a profusion of large, shining, yellow flowers: stem erect, much branched, leaves pubescent, ternate deeply incised and dentated: calyx spreading, villous, shorter than the petals and caducous. The root consists of an aggregation of thick fibres. Moist woods and grass lands. Flowers first of April.

Species 3d. RANUNCULUS NITIDUS. *Walt.*

Sp. ch. Very glabrous; *stem* hollow; *radical leaves* rotund-subreniform, obtusely crenate; *stem-leaves* sessile digitate, leaflets irregularly incised, lacinii obtuse; *seed* sub-globose, shining. *Walt. and Lam. by Pursh.*

Obs. I concur with Pursh in regarding this as but a variety of the first, from which it is chiefly distinguishable by its more luxuriant growth and very glossy, varnished appearance.—Flowers small, as in species 1st, of pale yellow colour. Rare; in company with the preceding. 10th of April.

(TO BE CONTINUED.)

ART. XI.—*Observations on Hydrocele.* By BENJAMIN WINSLOW DUDLEY, M. D. Professor of Anatomy and Surgery in Transylvania University, Member of the Royal College of Surgeons, London.

THAT the physician or the surgeon who desires information in regard to the diseases of the testes, should be unable to lay his hands upon a single volume, in the most extensive libraries, either in our own country or abroad, especially directed to this subject, furnishes matter of astonishment and deep regret, as well to the philanthropist, as to the professional character. The delicate and obscure little organ which makes us acquainted with sound, has received, as well in its anatomy as in its diseases, the attention of enlightened practitioners in the publication of volumes, and of the generous hand of charity, in the erection of buildings especially devoted to the cure of its maladies. The anatomy, physiology, and diseases of the eye, have been so minutely and patiently investigated by English, French, Italian and German authors, that every library contains a number of sources of information upon these subjects, and every country enjoys institutions for the alleviation and cure of its diseases; while in regard to the subject of this paper, not a volume has been written, not a building erected to its benefit by charity, notwithstanding the point will be conceded by all, that they are organs of paramount importance to virtue and happiness. As requisite agents in the perpetuation of the human species, it is conceived that medical authors have been guilty of a great dereliction of duty, in failing to furnish the young practitioner with that information, which would prepare him to discriminate, and to treat its various forms of disease, with better prospects of success.

The errors that are committed in regard to the diseases of these organs, with the appropriate class of remedies for each, not only among ordinary practitioners, but even those who by education, talents, and attainments, occupy conspicuous stand-

ing in the profession, are matter of notoriety. A reference to a few cases of sarcocele that are recorded by Professor Richerand in his "*Nosographie Chirurgical*," which were successfully treated by him, notwithstanding the decision of several eminent Parisian surgeons had been given against him, is in point. But it is unnecessary to go beyond the limits of the history of the various species of hydrocele, to obtain abundant evidence of the want of improvement in our knowledge of the pathology of the diseases of the testes. In this apparently simple malady, its Protean character has given origin to much erroneous speculation, as well in regard to the disease, as to the more advisable mode of treatment.

When congenital, hydrocele is to be cured by the same means which are resorted to with a view to the treatment of scrotal hernia in the infant. The fluid being thrown back into the cavity of the abdomen, where from the nature of the case we are permitted to infer it is secreted, it is only necessary to use pressure on the abdominal rings, thereby closing the communication between the cavity of the tunica vaginalis and that of the abdomen, to restore the parts to health.

Hydrocele in the more mature subject, is variegated in its seat, although the tunica vaginalis is usually the membrane which furnishes the secretion. But besides the variety in the seat of the dropsical collection, it is additionally complicated by appearing occasionally as a symptomatic affection: and again it is often complicated with other local diseases of these parts. There is an occasional variation in the form and appearance of the swelling in hydrocele, very well calculated to betray practitioners into error in regard to its character; while a variation in the colour and consistency of the secretion in other cases, throws the veil of obscurity around them. The encysted hydrocele, or that species which has only been noticed by medical writers within the last two or three years, wherein the fluid is collected in a distinct cyst within the tunica vaginalis, presents an embarrassing form of this malady. It is now ten years since I became acquainted with this peculiar form of hydrocele; and there are sufficient reasons for believing, that I first discovered this variety, because of my mode of treating the dis-

ease necessarily leading me to it; my practice being different from that which is universally pursued in Europe and the United States. Except that the manner of curing hydrocele by almost all the various modes of operating, which have been practised in Europe, and our own country, excludes the opportunity of detecting each peculiar species of dropsical swelling, the form alluded to above would no doubt long since have been accurately described by our predecessors. That it has been unknown to the profession, will be used as an argument of no inconsiderable weight, in favor of a treatment different from any hitherto adopted; since every peculiarity is necessarily exposed by the operation and treatment proposed in this paper.

Besides congenital, the testis is subject to ordinary hydrocele, hæmatocele, hydrosarcocele, hydrocele of the spermatic cord, encysted hydrocele, and hydrocele as a symptomatic affection: and it is clear, that a surgeon must be familiar with every species, and their varieties, in order to possess that confidence in his own skill, which will prepare him to offer rational consolation to his patient.

Hydrocele of the pure and simple kind, whether congenital or otherwise, presents a swelling of a conical shape, the base below, and the apex approaching the external abdominal ring. It has but little gravity, is elastic, semitransparent, and fluctuates by percussion. Sometimes the swelling is attended with considerable obtuse pain, but most frequently it is inconvenient alone, by reason of its weight and magnitude. Pressure on the posterior and lower portion of the scrotum generally points out the medium of connexion between the integuments and the inclosed organ, while we are often enabled thereby to judge of the condition of the latter.

In hæmatocele the swelling may be the same in form; differing however in possessing more gravity, with less transparency and less fluctuation than where the collection is purely serous. This form of the disease is generally attended by more pain than the more simple affection.

In hydrosarcocele there is great variety in the character of the swelling, in its form, its elasticity, its gravity, in the degree

of pain, in its sensibility, in the attachments between the integuments and the testis, and in its ultimate termination. It is here that surgeons of high pretensions to professional skill, are liable to misconceptions in regard to the true character of the case, and consequently to errors too often irremediable in practice. Hydrosarcocele is a swelling of more gravity, more opacity, more sensibility, more pain, with less fluctuation, than common hydrocele. The form of the swelling is generally the same with that of the less complex and more innocent affection. It often happens however that there is as great a departure from hydrocele in this respect as in any other feature belonging to that disease.

The enlarged condition of the gland is frequently attended by an inflammation of both peritoneal tunics; the consequence of which is, a union by adhesion more or less extensive, of the opposing surfaces of the tunica albuginea and the tunica vaginalis. Hence the hour-glass contraction in the centre, while the upper and lower portions of the vaginal tunic are highly distended by the dropsical secretion. Cases of this description are well calculated to betray practitioners into error, in regard to the nature of the malady, and the remedies to be relied on with a view to cure; as will appear manifest from the following history.

Mr. B. a merchant of this state while engaged in one of the Atlantic cities in the purchase of goods, embraced the occasion to become a patient of a distinguished physician on account of a disease of one of his testes of many months standing. He also secured the benefits of a consultation with two other gentlemen.

After a few weeks attendance, his physician urged upon him the propriety of exsecting the organ. Finally he was permitted to return home with the annexed letter of instructions. "Consultation, &c. &c. wherein Mr. B. is advised, first to pay the strictest attention to rest in a horizontal position; second, low diet; third, depletion by purgatives repeated every second day, or as often as necessary to act as an alterative, and bleeding, or leeching or both; fourth, irritation of the urethra by bougies; fifth, an alterative course of mercury may be necessary; sixth, suspension of the tumour. After a few weeks expe-

rience in the above course, if no alteration is effected, or if the tumor should become more enlarged and painful, affecting the spermatic cord towards the ring, extraction of the diseased testicle will be necessary. June, 1822." Soon after his arrival in Kentucky, he came to Lexington with a view to surgical assistance.

On the first examination I became satisfied with regard to the peculiarity of the case, and promptly offered an assurance that he would be well enough to return home in three or four weeks. In answer to which, I learned with some surprise, that he had visited me with a view to the exsection of the testis, in conformity with the above instructions. The swelling was very oblong with a remarkable contraction and induration in the centre; while either extremity of the swelling was soft and fluctuating. As he had left his letter of instructions at home, I suspended the operation until he should have an opportunity of ordering it to be brought to town.

By occasional examinations, I became conclusively satisfied that my first impressions of the nature of the disease were correct, having operated previously on several others of a similar character. In two days after the letter of instructions was placed in my hands, I proceeded to the operation.

Upon laying open freely the tunica vaginalis, the testis was found in a highly inflamed condition; attached by numerous media of organized lymph to the corresponding surface of the tunica vaginalis; the communication between the upper and lower portions of the dropsical swelling being nearly cut off thereby. Care was taken to divide all these preternatural adhesions between the gland and the tunic, as well with a view to the reduction of the enlarged organ to its proper magnitude, as to destroy adhesions that might subsequently prove embarrassing, in the restoration of the parts to their relative places.

At the expiration of the third week from the operation, he returned home perfectly well, having experienced no uncomfortable symptom during his recovery, more than must necessarily ensue from the disturbance of very sensitive parts when in a state of inflammation.

The following cases further elucidate the difficulties of this subject and the evils of the common practice.

Mr. G. a man about thirty years of age, delicate, slender, and of excessively excitable nerves, had for a long time been the subject of great chylopoietic derangement, with various erratic pains, that were peculiarly distressing when located in the testis. On one occasion when in the act of mounting his horse, he injured one of them, which was speedily followed by inflammation and swelling. For three months, notwithstanding the advantages of intelligent counsel, he suffered excessively, and without any intermission. On my first visit I found him in a state of great alarm; morbidly watchful of every thing around him, and his strength entirely prostrated. The scrotum on one side was large, tense, inflamed, and excessively sensitive, with evident marks of a fluid within. Being fully apprized of the exhausted and excitable condition of the patient, I could not hesitate to recommend an operation, as well with a view to its influence on the general system, as that of the local affection; inasmuch as it was perfectly manifest, that much of the morbid condition of the general system had its origin in that of the diseased organ.

By a free incision through the scrotum and tunica vaginalis, about half a pint of sanguineous serum was discharged; and upon exposing the testis, the albuginea was found excessively tense, a fluid being perceptibly included therein, while it was altogether of three times its proper magnitude, and sensitive to an extraordinary degree. A small incision being made into the albuginea gave exit to about a table-spoonful of a thick fluid, and immediately after, a portion of the gland turned out of the wound, in the shape of what is usually denominated fungus. The very highly deranged state of this patient's general system, seemed not at all alleviated by the evacuation of the fluid, and the removal of tension from the diseased organ; inasmuch as in the course of a few days after, the parts became gangrenous and he died.

Notwithstanding the physician in attendance was a gentleman of liberal professional education, and of some experience in practice, yet the great defect of our libraries on the subject

before us, had left him without the means of distinguishing this case of hydrosarcocele, which was part local and part constitutional, from some other forms of disease of that organ; a defect which proved fatal to the patient, while an early discrimination and a prompt application of appropriate remedies must have succeeded in restoring him to health. The case had been thought one of a scirrhous character, and remedies were prescribed accordingly.

A man came to town with hydrosarcocele, exceedingly irregular in form, and possessing various degrees of fluctuation on different points of its surface. On laying open the tunica vaginalis, about half a pint of serum escaped, and about half that quantity of a black sero-gelatinous fluid. At the inferior portion of the cord, a fleshy tumor, equal in magnitude to a hen's egg, presented itself, having no direct connexion with the testis. This tumor was removed, part by the scalpel and part by the fingers, as its texture was soft and easily broken down. The testis was considerably enlarged, but not otherwise diseased. Under the influence of the usual dressings, he recovered and returned to the country, about the fifteenth day after the operation.

A negro man of this vicinity made application on account of diseased testis. For several years he had been the subject of hydrocele, and had submitted to three operations with a view to cure by injection. In the last operation he experienced great pain from the introduction of the trocar and canula. The inflammation ran very high, and at the end of two weeks pus began to discharge through the orifice made by the instrument. The pain and inflammation consequent to the last operation, had confined him for twelve months previous to his application to me. Upon examination the scrotum of the right side was found as large as a quart-measure, and very irregular to the touch. Its anterior portion was puckered, drawn in, and closely united to an internal tumor, from which pus distilled in small quantities. The lateral as well as the superior portions of the swelling appeared to contain a large amount of fluid. On laying open the tunica vaginalis freely, it was discovered that the albuginea, which was very much

distended, was converted into a sac containing pus only. The sac was attached to the anterior portion of the scrotum, and constituted the source of the fistulous opening of that integument. Cases somewhat similar to this, have been recorded by Mr. Hunter. It constitutes the only one that I have seen, where the testis seems evidently to have been destroyed by the trocar. The parts were removed in the presence of the medical class, and the patient was well in ten days after.

Although cases purely dropsical in character might seem to present no very great difficulty in arriving at correct prognosis, yet even in this form of the disease there is such a variety, that the most experienced in the profession are too frequently unable to decide upon their peculiar nature. It was under the influence of this kind of embarrassment, in the year eighteen hundred and eighteen, that I first became acquainted with a form of hydrocele unknown to authors, but which has been noticed in London within the last eighteen months.

In the summer of 1818, Mr. ——— called on me and stated that the object of the interview with me was of serious import to him, inasmuch as it involved the loss of a testis. When a child, (as he stated,) he had accidentally lost one testis; that for the last three years he had suffered constantly on account of an irregular growth in the other, during all which time the function of the parts was entirely suspended, and that now he had reason to believe the disease to be of a cancerous nature.

In this state of painful anxiety he was willing to be the subject of any operation with a view to preserve his life. On minutely examining the part, I ascertained the existence of a swelling, which, although connected with a portion of the testis, did not involve the body of that organ. The apex of the swelling pointed transversely to the groin of that side, while the base appeared to involve the upper portion of the testis. The swelling was elastic to the touch, and the testis felt soft and reduced in size.

From the commencement of the disease, constant uneasiness with occasional pain was felt in the part, so that the patient could take but little exercise on foot, and none at all on horseback. After taking a dose of medicine to evacuate the bow-

els, he was placed on the table without any assurances in regard to the extent of the proposed operation. When the scrotum and tunica vaginalis were freely divided, a transparent capsule presented itself, nearly as large as a hen's egg. It was based upon the upper portion of the epididymis and rested upon the superior extremity of the testis. After the fluid was discharged, the sac was exsected. The edges of the wound were then approximated and dressed, and the patient put to bed. At the expiration of two weeks the wound had healed, and in a few weeks afterwards he told me with satisfaction, that the testis had recovered perfectly its function of seminal secretion.

After a period of about three years, he began again to complain of symptoms not altogether unlike those for which he had submitted to an operation. Various washes, suspensory bandage, abstemious living, laxatives and rest, were persevered in for two years. Finally he was compelled from unceasing uneasiness and pain, to become a surgical patient for the second time. Upon examination the tumour appeared to be behind and to one side of the testis. It was however even more distressing to the patient than the first affection. From his long continued suffering and uneasiness of mind, he was now resolved as a means of preserving himself against all future liabilities, to have the entire organ removed; and this was the condition on which my services were engaged on the second occasion.

When the parts were exposed in the operation, two globular sacs, each half an inch or more in diameter, were found attached to the central portion of the epididymis, where after acquiring some little magnitude, they operated as unceasing causes of morbid excitement, by their pressure on the central portion of the body of the testis. The peculiarity of the case was now explained to the patient, and the practicability of saving the organ made known; to which he replied, that being advanced in life he preferred an operation which would put him beyond the possibility of a similar occurrence. Accordingly the organ was removed in the presence of eight or ten pupils, and the gentleman speedily recovered.

In the winter of 1819, Mr. K. of an adjoining county, a young man of twenty years of age, came to town and placed himself under my care, on account of disease in both testes. Upon examination it was evident that there was a fluid involving both organs.

The unnatural form of the swellings, their want of magnitude, their fixed position in the scrotum, and the uneasiness which the patient was kept in by reason of an obtuse and aching pain, threw much obscurity around the case. Both testes could be very distinctly felt through all the inferior portions of the scrotum, as well in front and laterally as behind. After a few days preparation, he consented to be operated on in the presence of the medical class.

On laying open the tunica vaginalis, a sac originating on the inner surface of the tunic, nearly as large as a hen's egg, was suspended above the testis on either side. After the serum was evacuated, the sacs were each of them carefully exsected. The patient was dressed according to my usual manner, and was well in ten days.

In the summer of 1822, Judge —— became my patient on account of a diseased testis of several years standing. The general health of this gentleman had been much impaired for many years, but for the last two, he complained of little else than the diseased testis. All exercise gave him pain, but especially on horseback, so that he confined himself almost exclusively to his house, and maintained a horizontal position.

Being a very intelligent man, he had thought much on the nature of the local affection, and viewed it as intimately connected with the deranged actions of his general system, while from the occasional severity of his sufferings, he was frequently inclined to look upon it as cancerous in its nature.

Upon examination, an irregular oblong tumor of considerable size, appeared to involve the upper half of the testis, while the lower portion was free and natural to the touch. The whole contents, as well as the scrotum itself of that side, were in a state of morbid sensibility, and it was impossible, after all the examinations which the condition of the parts permitted me to make, to decide on the character of the swelling; yet I

was inclined to the belief that it was a sarcomatous tumor, since no sense of fluctuation was manifest, while it seemed to possess more of a fleshy feel. In this state of uncertainty, after about ten days preparation for the operation, the patient was placed on the table in the presence of several gentlemen, with a view to have all the morbid parts removed. So soon as the tunica vaginalis was freely laid open with a scalpel, a transparent sac larger than a hen's egg, turned out from its cavity, which had rested on the upper portion of the testis, and was radicated on the globus major of the epididymis. The sac was very firm and highly distended. After the fluid was evacuated, it was carefully exsected, the patient dressed and put to bed.

In the course of the evening he expressed himself as enjoying more the natural feeling of the parts, than he had for the last eighteen months previous to the operation. In sixteen days he recovered, and returned to his family in good health.

In the course of the past winter, an old man presented himself to be operated on for hydrocele. After a few days preparation, he was placed on the table before all the medical class. The swelling was large, conical, semitransparent, free of morbid sensibility, and fluctuating; thus presenting a dropsical swelling in all respects the most simple, while it promised the fairest prospects of cure under the usual treatment by injection. A free incision through the scrotum and tunica vaginalis gave exit to probably thirty ounces of serum. When this had all flowed out, the cavity of the tunic was examined, and on one side a small sac was discovered containing serum, which was exhibited to the class. Had this been overlooked, it would have increased as in other cases of encysted dropsy of this part. After it was exsected the patient was dressed, and by the sixteenth day was enabled to leave town.

Thus within the last ten years I have operated on five cases of hydrocele of a character unknown to surgeons, and since they cannot be managed by injection, a mode of treatment almost exclusively practised in Europe and the United States, they must have their influence in turning the attention of the medical community to another plan of treatment, which is

applicable to every variety of cases, always successful, less painful, and more speedy in its result.

Hydrocele is sometimes a symptomatic affection. A gentleman applied to me in 1816 on account of diseased testes. The one was swelled as large as a quart pitcher, and was sarcomatous; the other not less in magnitude, was dropsical in character. For three months he had been the patient of a physician in an adjoining county, and was lastly induced to come to me, with a view to submit to an operation. After repeated examinations, in which I entered thoroughly into his history for the previous eight years, I became satisfied that the affection of the testes was subordinate, while the general system was disordered to a very extraordinary degree. All the bones of his system, but especially the ribs and other superficial bones, were enlarged to twice their proper dimensions. Upon examining the urinary secretion, it was found entirely destitute of its accustomed saline ingredients.

In the treatment of the case, the patient was induced to attend to the changes in the quality of this secretion; and after being fairly under the influence of constitutional remedies, he collected every morning for a month in succession, a large tablespoonful of precipitated salts, the urine still holding a large quantity in solution. Before the cure was made complete which required five months and a half, both testes were restored to a perfectly healthy condition; while the bones so far as observations could be made, were reduced to their natural size.

In an article which it is contemplated to publish at some future period on the subject of syphilis, this case may become the more interesting, since the various parts of the body as well as the different senses, were successively paralytic during the progress of the malady.

The different plans of treating hydrocele by cautery, by seton, and by laying the tunic open and filling it with baker's dough, after the manner of Mr. Hunter, have been successively abandoned, and for very obvious and satisfactory reasons. That by injection which superseded all the previous plans of cure, is frequently unsuccessful in the most skilful hands, while

in many cases, it is found entirely inapplicable. It was the uncertainty of the cure by injection, together with the painful consequences of the operation, that led Mr. Larrey the great military surgeon of France, to a new mode of treating hydrocele. This consists in the introduction of a flexible catheter into the cavity of the tunic, to be confined there one, two, or three days, or until the serous secretion should cease. Possibly under the influence of the same train of reflection, an American gentleman proposes the exsection of a small portion of the tunic, rendering the sac thereby imperfect. In the course of our practical remarks, I shall take occasion to express my opinions, and to offer the result of my experience, on those different plans of treatment. In the first place however, I propose to examine the propriety of the practice by injection, a practice which has been adopted by almost all surgeons for more than a quarter of a century.

In the best defined and most simple cases of hydrocele, there are scarcely any two operators, who are in the habit of using the same description of stimulating injection; nor is any surgeon prepared to say, that an injection of the same strength, is equally applicable to the old, and the young, the excitable and the unexcitable subject. Hence it happens that most excruciating pain, and tedious suffering, are endured by one patient, when the use of the same or a similar injection in another, would fail to excite the requisite inflammation in the tunic. The same patient under different circumstances in regard to his general system, might require injections of very different degrees of strength; and where both organs are dropsical, the one may admit of an injection, which would produce no impression on the other, by reason of the different susceptibilities of the two. It often happens in hospital as well as in private practice, that one patient will suffer excessively for several days, from the use of an injection, that would prove entirely inert in another. Hence one reason why the operation is so often unsuccessful. But the operation by injection is objectionable from other considerations, than that of the different susceptibilities of patients to be acted on by it.

In hydrosarcocele the practice of injection is improper as

well from its necessary tendency to aggravate the diseased condition of the testis, as from the danger of wounding and destroying that organ by the trocar. Independently of the case recorded in this paper of the loss of the organ from an injury done by the instrument, Mr. John Hunter bears testimony to the truth of this assertion. In all the variegated forms of hydrocele, in which the fluid is confined in preternatural sacs, either within or without the tunica vaginalis, the operation by injection must fail; as well because of the difficulty of introducing the trocar without doing violence to other parts, as of the impossibility of destroying the sac thereby. It is equally inapplicable in those forms of hydrocele in which the fluid collection is too viscid to pass the caliber of the canula, as it is defective and unsatisfactory in its tendency, in all those cases, where there are tumors of more or less magnitude, either involving or unconnected with the gland.

Waving other considerations, it is thought that the method of cure by injection does not deserve the support of the profession, because of the alarming consequences which sometimes are witnessed, even when the patient is in the most experienced hands. In the large hospitals as well as in private practice, it occasionally happens that the whole of the injection is forced into the cellular substance; an accident necessarily followed by inflammation and mortification of the parts. It is but a few years since (1824,) I received a letter from a gentleman who after detailing a case of hydrocele observes, "I determined to try for a permanent cure, and after drawing off the fluid, I suffered the canula to remain, and then threw in an injection of a weak solution of "sulphas zinci." This produced great pain, prostration of strength, sweating, &c.; these I expected. But when I wanted to discharge it, I was not a little surprised at being unable to evacuate even a drop. Your advice is desired."

Sir Astley Cooper was in the habit of reciting a case of this description in his lectures which happened under the care of a surgeon of Guy's Hospital, where the whole of the scrotum dropped off in a poultice, leaving the testes perfectly bare. It is proper however to state, that the case was referred to, more especially to give an instance of the restorative powers of na-

ture, as the testes were enclosed in a new integument by the twentieth day.

The number of times that the operation is repeated in the same case, on some occasions, before a cure is completed, constitutes another strong objection to the plan of injection.

A young gentleman, the last case but one that I have operated on, had been the patient of fourteen different physicians, by whom ten operations had been performed on him, with a view to cure a case of simple hydrocele.

In consequence of so many unsuccessful operations, the testis was somewhat enlarged, and morbidly attached to its membranes. After this gentleman's recovery he assured me, that of all the operations he had submitted to, being eleven in number, the last had caused him the least pain and inconvenience, while he recovered from it in the shortest space of time. Among those conversant with the general principles of medicine, it will not appear strange, that there is least pain and suffering in that operation, which by a free incision, brings opposite surfaces immediately into contact, unites them by adhesion, and thereby arrests the farther progress of inflammation.

From various portions of this and the adjoining states, I have had patients with different species of hydrocele, very few of which had been correctly understood, by those physicians who had been consulted; nor is it reasonable that it should have been otherwise, when it is recollected, that the true source of improvement is cut off by the fashionable mode of treatment. Ocular examinations of diseased parts is the most rational mode of improving our knowledge of the diseases incident to any organ.

Under the influence of these views I have for the last thirteen years pursued a course in practice, which has in all respects been more satisfactory than what is inculcated in surgical authors.

A free incision through the scrotum and tunica vaginalis gives the patient pain for the instant; but before the dressings are applied he is generally easy, and rarely has much pain afterwards. The operator now has an opportunity of examining the condition of the testes, the epididymis, and the inner

surface of the tunica vaginalis, of removing viscid fluids, preternatural sacs, hydatids and sarcomatous tumours.

Every thing being accomplished which may be demanded by the peculiarity of the case, particular care is necessary in the application of the dressings; and these must vary according to the seat of the dropsical secretion.

It is clear that in all those forms of dropsy, where the fluid is contained in a preternatural sac, there can be no possible danger of a recurrence of the malady, provided the sac be exsected, as advised in this paper. On the contrary, when the tunica vaginalis furnishes the secretion, precautions must be taken in the dressings to prevent the return of the complaint. I have on many occasions known hydrocele to return in five days after an operation, in which the sac had been opened to the extent of from four to six inches. It is necessary then, while all the middle and superior portions of the incision are placed under circumstances favourable to reunion by the first intention, to keep the inferior portion of it open, by the introduction of a small tent within the cavity of the tunica vaginalis. One or two inches of the tent should be within the tunica vaginalis in order to prevent its being drawn without the sac, by the swelling of the integuments. Notwithstanding the precaution of inserting a tent, I have several times witnessed the recurrence of hydrocele, which was manifest on the first dressing after the operation.

In such cases the tent is found dry and closely adherent to the integuments, while a copious secretion of coagulable lymph around that and within the tunica vaginalis has excluded it from the common cavity, and thereby the sac is made perfect. Under such circumstances it is necessary forcibly to take away the tent, and break down the lymph by means of a common probe. Although it has never been found necessary to repeat this operation, as the discharge will now be kept up even without the tent, yet the patient's confinement is somewhat increased by it, inasmuch as additional pain and inflammation is excited.

The general dressing to the wound should always be light and simple. A few strips of adhesive plaster, with a view to

approximate the divided surfaces, are generally advisable. It often happens however, that in the contracted state of the parts, which follows the operation, the edges of the wound become so well adjusted, that a common suspensory bandage, with a few folds of cloth to protect the wound from the bed clothes, are alone sufficient.

A young gentleman belonging to the medical class four years ago, was the subject of hydrocele on both sides. I explained to him the operation of Monsieur Larrey, consisting in the introduction of a flexible catheter into the sac to be confined there as a conduit for the serum, until a change in the action of the part should take place; and proposed that we should operate after this manner on one testis, and according to my own plan on the other; to which he consented. Being placed on the table, a puncture of sufficient magnitude was made into the tunic of one side, by means of a double edged scalpel, and a common flexible catheter was introduced. On the other side, a free incision gave vent to a copious collection of serum, the testis, epididymis and tunic, all being healthy in appearance. A small tent being introduced through the incision into the tunica vaginalis, the patient was dressed and put to bed. On the third day the outer end of the catheter being dry it was removed. On the fourth day the tent of the other side came away by suppuration, and was not renewed afterwards. During all the time that the catheter was retained in the tunic he complained of soreness and uneasiness, and suffered exceedingly with swelling and inflammation for twelve days afterwards.

When this gentleman was well, he assured me, that he would sooner undergo the pain and confinement of the operation by incision four times, than that of the flexible catheter once; since the one gave him pain and uneasiness for a few minutes, while in the other they were unceasing for twelve days.

The plan of treatment for hydrocele proposed by an American surgeon, whose name has escaped my memory, consisting in the removal of a small portion of the tunica vaginalis. thereby rendering the sac incomplete, is found not to answer from two considerations. First, it will not answer the purpose of discharging the contents of preternatural sacs. Secondly,

although in common hydrocele the fluid is evacuated by the exsection of a portion of the tunic as large as the finger nail, yet so soon as the parts contract from the discharge of the fluid, it is ascertained that the first effort on the part of nature consists in repairing the breach, while the secretion of the dropsical fluid is suspended until that process is accomplished.

Those cases where the tent is introduced, in which a recurrence of a dropsical secretion has become manifest in four or five days after the operation, are perfectly in point.

After surgical operations, when the patient has been dressed and put to bed, it frequently happens, that the attendance of the operator is required to check a hemorrhage. Operations upon tumors of the neck and breast, and upon the scrotum, are particularly apt to be followed by hemorrhage, some little time after the dressings are applied. Partial pressure and the presence of extraneous bodies in wounds, have a peculiar effect in exciting a hemorrhagic tendency in wounded vessels. On one occasion after removing a tumour from behind the angle of the jaw, which was attached to the transverse processes of the second and third vertebræ, I was near losing my patient by ineffectual pressure, made with a view to check a hemorrhage that continued obstinately and alarmingly, until that measure was abandoned. Immediately after pressure was removed, and the parts were cleansed of coagulated blood, the vessels contracted and the bleeding ceased.

I have often remarked this hemorrhagic disposition after operations upon the scrotum. In almost all cases, the bleeding will immediately cease upon the removal of all compression; and I have met with instances wherein it became necessary even to take way the tents used in operations for hydrocele, before the bleeding could be checked.

This principle in reference to hemorrhage, is looked upon as a very important one, in almost all cases, wherein the loss of blood is involved. While complete pressure is decisive in its effects upon a bleeding vessel, imperfect compression excites and aggravates the disposition to bleed. In all these cases it is proper to cleanse the wound of all coagulated blood, since the notion of its becoming a bond of union, is one of the few errors to be found in Mr. Hunter's writings.

REVIEW.

ART. XII.—"*Elements of Phrenology, (second edition, greatly improved,) by Charles Caldwell, M. D. Professor of the Institutes of Medicine and clinical practice in Transylvania University.*" COMMUNICATED.

EVERY man who, in any age, has been successful in the propagation of a new doctrine, has been of an enthusiastic temperament, bold, and persevering. Such was the character of St. Paul, of Calvin and Wesley in religion; such was Sir Isaac Newton, Gallileo, and Harvey in philosophy; such the framers of our glorious independence; and such, we would continue, are the promulgators of the new and much slandered system of mental philosophy, *phrenology*. Such a character, indeed, a character ardent, zealous, independent, loving truth, and reckless of consequences, is a sine qua non in an enterprize of such difficulty. For against every effort which looks to widening the borders of knowledge, and to a revolution in science, the prejudices and angry feelings of men are sure of being enlisted; the indolent, because of their aversion from study, and the learned, that their cherished theories are jeopardized. Hence originals are denounced as innovators, visionaries; their doctrines are labelled with such names as absurdity, folly, nonsense, or represented as unfavorable to morality and those interests which good men account most sacred. The discoveries of Newton met with a cold reception from the philosophers of his day; Harvey parted with an extensive and lucrative practice when he made his grand discovery—such was the force of the envy and hatred of his brethren; while the Italian philosopher, as a reward for the invention of the telescope, was compelled to seek in a foreign land, and among strangers, an asylum from persecution.

The author of these Elements is illustrative of the truth of the proposition with which we set out. He is confessedly in the van of American phrenologists, and having by his unce-

ing labours in its behalf identified his character as a philosopher with the science, whatever may be its ultimate fate, much of the credit or odium of having given it spread, will be due to him. It is in character with him to embark in enterprizes of apparent hazard; to risk his reputation; to be zealous, sanguine, independent; to push on in the pursuit of truth fearlessly. He has never belonged to the vacillating, time-serving class; but without pausing to count the cost, has been ready at all times to travel into the terra incognita of science, opposing as he went, the hierarchy of the day. The medical literature of that period declares the part which he acted when Dr. Rush, lord of the ascendant, wielded the sceptre over Medical America, and like Moses, gave law to the young and the uninitiated. He was one of the first to assert, and one of the most prompt and efficient to defend the doctrine of the non-contagiousness of yellow fever, and at a time too, when no opinion was esteemed more heterodox. At the present time he is remarked in every part of our country, as the staunch, implacable enemy of the humoral pathology in every form and degree, and for his enthusiastic devotion to the doctrine of sympathy.

It could hardly be expected that a man who has waged so extensive a war—a war of extermination often, unrelenting, and complete—who has broached so many opinions at variance with the commonly received notions of mankind, should escape entirely scoffs and contumely. The wounds which have been inflicted upon his private character; the slanderous allegation that he entertains, and teaches from his chair the doctrine of materialism; the charge, made even from the sacred desk, on at least one occasion, that he is at heart, and by profession a deist, do not these things attest the vigour with which hatred and malice, and all uncharitableness have been at work? Many have been the ingenuous and fair minded youths (we were of the number) who have repaired, after pious warnings to beware of the "faithless phantom" of doctrines leading to the pit, to his lectures with fear and trembling, lest unwittingly they should be made infidels.

It seems to be the fashion of the times to ridicule phrenology, and run it down. There can be nothing in the science intrinsically ridiculous. It is but an exposition of mind, of our intellectual, our better portion—of the divinæ particula auræ, which, by a divine hand, has been bestowed upon us. Metaphysics is the popular name and is a popular study; and yet all must agree that phrenology is a much more significant term. But intrinsically, and per se, phrenology is a science entitled to more consideration than metaphysics. The latter is a theory of preconception, founded upon attention to the operation of our own minds; the former is a science of induction. Phrenology, proceeding upon observation, declares that nature has created diversities in individual and national intellect, bestowing it in different degrees upon different men, and upon the African, the Indian, and the Caucasian; while metaphysics teach that all individuals, and kindreds, and tongues, come alike from the hand of the Creator. Phrenology holds that the nature of man, like every other object in creation is determinate, and that his faculties are innate; that as his corporeal part is provided with organs of sense, locomotion, digestion, &c. so his intellectual portion is endowed with specific powers also; while metaphysicians declare that faculties are the creatures of moral and physical circumstances. Metaphysics being the creature of fancy, are ever crumbling under the touch of different masters, and assuming, like bodies under the control of chemical affinities, new shapes and characters, while phrenology, based as it is upon induction, must continue to go on by progressive steps of improvement until it attains perfection. Each succeeding metaphysician must travel over the whole field of mind, conquering it anew; but in phrenology, every triumph will be made subsidiary to succeeding conquests. Difficulties once vanquished, will not have to be again overcome.

But Phrenology is opposed because, say its enemies, it is visionary, and even if true, is not applicable to any of the practical purposes of life; and if its advocates aspire to indicate its utilities, and attempt to shew that it is destined to shed light upon education, criminal law, and the yet darker subject, men-

tal alienation, they are ridiculed for their presumption. But phrenologists need not point out the utilities of the science. If true, its truth alone constitutes a sufficient recommendation to its study. No subject certainly can be more interesting, no study can give us purer enjoyment, or more sensibly enlarge and liberalize our views, than that of mind. When Harvey discovered the circulation of the blood he was not required to indicate the points of human interest which it was destined to elucidate, and scarcely dreamed of the salutary improvements which it was calculated to effect in physiology and the treatment of diseases. Would not astronomy be in itself a delightful, a dignified, a sublime study though it illuminated none of the pathways of practical life? Natural history is cultivated, and mineralogy and geology are studied, and studied with enthusiasm too, not more because they are practical, than that they enlarge the compass of our intellectual ken.

We believe phrenology as taught in the school of Gall, is the only system of mental philosophy from the day of Plato to the present time, which affords a satisfactory and correct exposition of the human mind; and Dr. Caldwell's book we esteem the best exposition of the system. It was reviewed in the first number of this Journal, to which we would refer readers for a view of the fundamental principles of the science, as well as for the substance of the work, it being our intention here merely to analyze the matter appended to the second edition.

It is a leading thought of this work, evidently a favorite one with Professor Caldwell, and it is the basis of anthropology, of which phrenology is but a branch—that man not only is constituted as we find him, but to act his specific part in creation, he must be thus constituted—that, in relation to his intellectual frame, "whatever is, is right." That as the lion must have ferocity, the dog courage, and the deer swiftness; as birds must have wings and fish have fins, to enable them to answer their "being's end and aim;" so man to be in place, to harmonize with the other parts of creation, that the great work may be symmetrical, must possess physical love, and a love of combat and of approbation, and pride, veneration, benevolence, and all the various propensities and passions with which

he is endowed. Our natures are of God. In infinite wisdom they were created as they are for a wise purpose. Nevertheless, man's moral economy is not now what it was when he came from the hands of his maker. His faculties are the same, but they have been perverted; his propensities are what they were, but their malign exercise is the result of the moral obliquity wrought by man's first disobedience. When placed in Paradise fresh from the hands of his creator, the powers of his mind were harmoniously adjusted—each performing its office in unison with the rest; none were in excess, none were defective; and then it was that he was pronounced very good. But the tempter came: confusion and misrule succeeded to harmony and order; passions then became rebellious; feeble reason succumbed to the more active powers, and thus was stamped upon him the character of "enmity against God."

A leading addition to the work is a preliminary discourse of fifty-eight pages, which is in itself a distinct essay, vindicating the science against an attack recently made on it, by Mr. Jeffrey, editor of the Edingburgh Review. The Edingburgh has always been a foe to phrenology. Its decree went forth fifteen years since, that the infant should be strangled; but, very pertinaciously it has continued to adhere to life, and the editor has put forth his last, mighty effort at its overthrow in a review of Combes' Phrenology.

Dr. Caldwell has taken up the weapons of literary warfare on this side of the waters in defence of his brother phrenologist, and the result of his efforts is this discourse, which has been pronounced by competent critics, and will be esteemed, we think, by all the unprejudiced, reponse sans replique. It is indeed triumphant. We know that our author will be thought by the *servile pecus*, who derive all their opinions from British books, and who esteem all that as *trash* which has not crossed the Atlantic, vain and presumptuous for questioning the infallibility of the literary Pope; and we know too that we shall be set down as not among the initiated, because we do not join with the crowd of critics in the hue and cry against phrenology. But we choose to think for ourselves in literary as well as in political matters.

We object to the tone of the discourse. It is too harsh and embittered. Dr. C. has measured back, in retribution, too much of the same species of coin that the reviewer meted out to phrenologists, that he himself so forcibly condemns. It is of high authority that "whoso taketh up the sword shall perish by the sword;" and if any man merits such severity, if a vein of fierce, vindictive sarcasm, "with Hecate's bane thrice blasted, thrice infected," may be indulged in towards any one, it is Francis Jeffrey.

One of the first steps of our author is to point out one of the reviewer's misrepresentations, a thing of which in the course of his tirade, he is not unfrequently guilty. He makes phrenology to teach that there are organs of "*vice, external sense, acquired habit, infirmity and accomplishment,*" in which, if he understood his subject, he must have been conscious he was calumniating the science. Such doctrines are not taught by phrenology. Habit and accomplishment are adscititious qualities of the human mind, bestowed by education; while vice and infirmity are but a perversion of its faculties. Combativeness is not a vicious propensity when properly directed; nor is destructiveness sinful when confined to its legitimate objects.

The journalist thinks "there is not the smallest reason for supposing that the mind ever operates through the agency of any material organs, except in the perception of material objects, or in the spontaneous movements of the body which it inhabits."

Dr. C. replies thus to his assertion.

"The lofty and brilliant conceptions of the orator, the profound calculations of the mathematician, and the inspired flights of the poet, are operations of the intellect totally different from those of the 'perception of material objects,' and 'the spontaneous movements of the body.' Yet, by an injury done to certain portions of the brain, they are as completely and certainly extinguished, as vision is by an injury of the eye, or hearing, by the destruction of the organization of the ear. But this could not be the case, if those intellectual processes

were not performed through the instrumentality of the brain, which our journalist will admit to be a material organ."

"Mr. Jeffrey's assertion that 'the strength and perfection of the external faculties of the intellect have no dependence on the size of their organs,' is an error too gross even for him to have committed, notorious as is his ignorance of physical science. That those animals most remarkable for their acuteness in seeing, hearing, and smelling, possess, other things being alike, the largest amount of optic, auditory, and gustatory nerves, is reduced to a truism of which it is disgraceful to be ignorant."

None but the most infatuated can help seeing that Dr. C. is in the right on the above points.

Our author believes that each of the five external senses has appropriated to itself a peculiar portion of the brain, for which he offers several very forcible reasons: and he thinks this opinion is supported by the experiments of Bell, Magendie, and Flourens.

The reviewer thinks it would be exceedingly preposterous to assert that we do not "know certainly, naturally, and immediately, that we see with our eyes, hear with our ears," &c. and yet all must agree that it is the mind that sees and hears, and not the eye and the ear, they being nothing more than the mechanical instruments, through which the mind takes cognizance of external objects. Besides, we do not know "naturally" that these are the organs of the mind, but come to a knowledge of the fact by observation alone.

The reviewer objects to the science, because it remained so long concealed, and was at last discovered by "German Doctors." This objection, in the lump, is unspeakably silly. Why were not the circulation of the blood, the identity of electricity and lightning, galvanism, printing, &c. discovered at an earlier period of the world, and by other individuals than Franklin, &c?

Another objection with the reviewer is, that the brain has been destroyed, the mind remaining uninjured. As this objection was answered at length in our former review, we shall pass it by without remark at present.

One of the gravest and most weighty objections which the journalist has offered, shows him to be wholly unacquainted with the laws of the animal œconomy in health and disease. Madness cannot grow out of the brain, else the individual would be "insane upon the same key from his youth up." By a parity of reasoning we would prove that consumption is not the effect of diseased lungs, because the patient is not disordered from his "youth up." So also gout is not hereditary, nor is a faulty organization its cause, because youth is favoured with an immunity from the disease. In like manner, apoplexy cannot be the result of a brain predisposed from infancy to the disease, because the patient is not diseased till in advanced life.

Finally, the reviewer objects to phrenology, because according to it "character should be always indelible." The language of phrenology is the reverse of this. It represents it as constantly and necessarily, in the order of nature, changing through the whole period of existence, the organs of the propensities being alone developed in early infancy: propensities alone compose, at this period, the infantile character; as childhood advances the knowing organs are progressively developed, and then the child is actively cognizant of the external world; while as youth and manhood approach, other developements take place; the individual becomes reflective and elevated in his moral sentiments, and under the influence of the matured organ of physical love, "begins to be intensely sensible of the real object and end of his existence." Nor does the change stop here, but remaining mature and well-balanced for a certain time, the faculties commence at length the downward march of decay. Amativeness fails first, then destructiveness and combativeness, hope, ideality and language; while conscientiousness and veneration are among the last to experience the debility of age." By certain processes of art, as well as in the natural progress of human life, phrenology teaches us what changes are effected in the human character. "Intellectual and moral education is nothing else but the effects resulting from changes produced in the condition of the brain." This point is thus illustrated by the author.

"Let any cerebral organ, as that of amativeness, combative

ness, destructiveness, or love of approbation, be under such strong and habitual excitement, as to sway the intellect, and impress on it a corresponding character. An event occurs—and many such may and do occur—which by a deep counter-vailing impression, transfers the excitement to conscientiousness, veneration, benevolence, or the reflecting organs. The consequence will necessarily be a very material change in the intellectual character."

We are admonished by our limits to stop our analysis of the discours preliminaire here, conscious, as we are, that many of its most interesting topics are untouched. But we hope all who read this review will repair to the work itself for ample instruction.

Until the 8th section, no very striking additions have been made to the first edition of the work. The illustrative matter is more copious and varied, particularly in the 6th section, on organology, where greater amplitude of illustration was very necessary.

The 8th section contains a great amount of new and interesting matter. In it the difference of view, between phrenologists and metaphysicians, relative to the nature and number of faculties is pointed out.

"Perception, memory, imagination, judgment, abstraction, attention, association, and indeed all the faculties so denominated by Locke and his followers, are nothing in the phrenological school but so many functions, or modes of operation of one or more of the primitive faculties."

His views on association will explain the other functions. "The brain, consisting of a multiplicity of organs, is of itself a system. In the very nature of the case, therefore, the organs must be associated; because system necessarily implies association. When ideas, therefore, seem to be associated, it is in virtue of the sympathy, native or acquired, or both, of the organs that form them.

During the period of their loves, the males of most tribes of inferior animals are inordinately irascible, ferocious and destructive. This arises from the excitement sympathetically communicated from the organ of amativeness to those of combativeness and destructiveness.

In the production of poetry, history, logic, geography and eloquence, the cerebral organs are differently associated. Even in the writing of different kinds of poetry, different associations of organs are requisite.

In those who devote themselves to amatory productions, the organ of amativeness unites in the association. Is the poet inclined to sing of war? Combativeness is one of the associated organs. Does he incline to sing of heavenly things? The association includes the organ of veneration."

"*Taste and criticism.* Good taste is the result of a well adjusted balance and harmonious action of all the faculties. It is a prompt and correct perception of aptitude and elegance. Is the production poetry? That is the most excellent which ministers most to the gratification of the higher sentiments and the intellectual faculties, without offending them by incongruity of combination, inaptitude of language, or extravagance of figure."

"*Genius.* Genius consists in a condition eminently excellent of a part or all of the knowing and reflecting faculties, fitting them for prompt and powerful action. The highest degree of genius results from this condition being raised to the highest degree of attainable excellency." There is a genius for music, a genius for painting, a genius for languages, for numbers, &c. all of which are partial: a universal genius is rara avis in terris—perhaps never existed.

We esteem this an admirable explanation of association and genius; nor is the following exposition of instinct less happy.

"Instinct bears an immediate relation to the subsistence, welfare and safety of the individual animal to which it belongs, or to the propagation, nourishment, and preservation of its young. It is a primitive and vivid propensity, in perfect harmony with the scheme of the life of the animal, and constituting, in its operation, a part of that scheme." It is by virtue of this propensity, that the young of mammiferous animals no sooner see the light than they seek the fount of their proper nourishment; that the young of aquatic fowls rush without instruction into the water; that birds construct their nests in a way best to secure the comfort and safety of their offspring,

that the beaver builds his hut, the rabbit excavates its burrow, and the spider weaves its web, on principles and in forms specifically adapted to their several modes of life. Animal instinct is an intellectual faculty, but it is still the result of cerebral organization. "The instinct in the squirrel and beaver to build, arises from the large size and active condition of the organ of constructiveness—of the tiger to destroy, destructiveness; of the stork and wild goose to migrate, locality; and thus some men are instinctively conscientious, benevolent, or pious, in consequence of a large developement and high excitement of the organ of conscientiousness, benevolence, or veneration.

Expression. This is what is meant, in other systems of phrenology, by pathognomy, or natural language; it means the external manifestation of internal feelings, by gesture, attitude and sound. We have not room for examples. We think the author has failed in his attempt to explain ventriloquism upon phrenological principles. We believe with Dr. Good, that it depends upon the superior control which some individuals possess over the muscles of the larynx, and perhaps, upon some peculiarity in the structure of this organ.

In concluding the main part of the work, he makes a few brief remarks on the application of phrenology to education, criminal jurisprudence, and insanity; but it is not until we arrive at the 214th page, in his concluding essay, that we find the subject treated in any detail. Teaching as the science does, "That the intellectual faculties are not developed collectively, but progressively, from childhood to manhood," the propensities first, then the knowing faculties, and last of all, the moral sentiments and faculties of reflection; we learn from it the course in which education should be conducted. "The faculties must be instructed in the order in which they are developed." The propensities claim the first care, and their education should commence in infancy; then, as the march of developement goes on, the knowing faculties must be called into exercise; and finally, as maturity approaches, the higher sentiments and the reflecting faculties must be employed. Besides this, phrenology will make us acquainted with the predominant faculties of each individual, and we will thus be able

to direct each to those pursuits for which he is particularly qualified by nature. "Thus will every pupil move in his proper sphere, and attend to the objects peculiar to his age, and to the peculiar capacities with which he is endowed." In the education of early infancy, one propensity must be made to act as a check on another, so as to produce the requisite balance, and prevent those "vices which arise from excess of indulgence, in any line or description of feeling." The same principle must be observed in the subsequent education. "Does the youth under education manifest, in excess, the propensities to combat and destroy? In opposition to these must be arrayed the reflecting faculties, with the moral sentiments of benevolence, the love of approbation, conscientiousness, and cautiousness."

Our limits preclude further details.

"In courts of justice, both civil and criminal," the author thinks, the influence of phrenology is destined to be important. "A culprit is put on trial under a charge of murder. What are his developements? Are they very bold and prominent, in his animal, and moderate, or very small, in his moral or reflective organs? If so, they are calculated to add strength to other circumstances unfavourable to his innocency. Is the developement, on the contrary, the reverse of this—the animal organs small, and the moral and reflective ones very full? That presentation speaks, in behalf of the accused, a favourable language."

The author points out its utility to general politics and legislation, to the orator and the general, whose business it is to govern and lead men; and finally, to the physician. Intellectual derangement is a material affection—the result of partial or general cerebral disorder. When the individual is disposed to commit murder, destructiveness is the deranged organ; theft, covetiveness; has ambition maddened him? Love of approbation is the organ affected."

The work concludes with a learned disquisition on national character, embracing remarks on the diversity of colour, in which the author combats, with great ingenuity and force, the opinion of Dr. Good, Mr. Everett, and others, that in

natural endowments all men are equal. He has displayed acuteness and deep learning, with not a little of his characteristic sarcasm, in the controversy, and has, we think, the better of the argument. We do not believe that nature has bestowed her gifts in an equal degree upon all. The Caucasian race, we feel disposed with the author, to place above the African, the Indian, &c. in the scale of intellect.

But we hasten to conclude an article already perhaps too much drawn out. One word as to the tone, and moral tendency of the work.

We have already objected to the tone, that it is too harsh and combative. Throughout, the author, when travelling over contested ground, has dipped his pen too freely in the gall of bitterness. The style of his remarks, in reply to Dr. Good's arguments, appears to us peculiarly objectionable. Dr. Good was the most learned, and one of the most liberal and benevolent men of his age. He never dealt himself in harsh denunciations; and now that he is no longer engaged in the toils and frettings of this world, his opinions should be handled with the utmost tenderness.

But we cannot join with those lugubrious critics who denounce the work on account of its immoral tendency. We think we have studied both it and the rest of the author's productions, with as much care, and we would add, impartiality, as any of those who fault them; we hope we have as sincere a regard for the Christian religion, which we consider the last, great anchor of human hope, as the most pious of his calumniators, and yet we honestly believe that all suspicions of their hostility to religion, have arisen from a misconception of their doctrines.

So far from being irreligious, his system of phrenology provides for an organ of veneration, whose exercise is Divine worship; and he lays down the plan, in detail, by which the unruly passions are to be subdued, and men to be made pious and good.

L. P. Y.

MEDICAL GRADUATES.

At a commencement held in the Chapel of Transylvania University, on Wednesday the 12th of March 1828, the degree of Doctor of Medicine was conferred upon the following gentlemen, *alumni* of the School, who have written and defended Theses upon the subjects annexed to their names.

I. KENTUCKY.

1. Stephen Walker Bates, *On Hernia Humoralis.*
2. George Washington Campbell, *On Suspended Animation.*
3. Henry William Coburn, *On Morbid Sensibility of the Stomach and Bowels.*
4. William R. Davis, *On Fever.*
5. Warren Frazer, *On Organic and Functional Diseases of the Heart.*
6. James St. Clair Leavell, *On Dyspepsia.*
7. John Whittingdon Long, *On Dyspepsia.*
8. Augustus William Mills, *On the Medical properties of Secale Cornutum.*
9. Thomas Shelton Moberly, *On Gonorrhœa.*
10. Jehu Perkins, *On Cholera Infantum.*
11. Thomas Jefferson Pollard, *On Cynanche Trachealis.*
12. Lemuel Sanders, *On Chlorosis.*
13. William Cooper Turner, *On the Dependance of Functions.*
14. Joseph Smith Wallace, *On Phlegmasia Dolens.*
15. John Warren, *On Hygieine.*
16. William Wilcox Warren, *De Febre puerperali.*
17. Ferdinand Fox Young, *On the Modus Operandi of Medicines.*

II. TENNESSEE.

18. John Jefferson Franklin, *On the Humulus Lupulus.*
19. William McKendree Gwin, *On Syphilis.*
20. Leander Hughes, *On Fistula in Ano.*
21. Robert Nicholson, *On Chlorosis.*
22. Samuel Crockett Sloan, *On Inflammation of the Liver.*

23. Sydney Smith, *On Purulent Ophthalmia.*
24. Littleberry Williamson White, *On Fever.*
25. Chesterfield Lewis Wilcox, *On Secretion.*

III. VIRGINIA.

26. Abraham Addams, *On the internal changes produced by the remote causes of Fever.*
27. Absalom Walker Scales, *On the use of the Bandage in Gun-Shot Injuries.*
28. Samuel Glover Shaw, *On Dysentery.*
29. James Clay Sullivan, *On Aneurism.*
30. Milton Vaughan, *On the processes instituted by Nature for Suppressing Hæmorrhage.*
31. Samuel Vaughan Watkins, *On the effects of cold upon the Human System.*

IV. SOUTH CAROLINA.

32. James Anderson, *On the Diseases of the Schneiderian Membrane.*
33. William Askins Ardrey, *On the Liver.*
34. Virgil Bobo, *On the Datura Stramonium.*
35. Thomas Jefferson Braselman, *On Typhus Fever.*
36. Hugh Hugher Toland, *On the Medicinal properties of the Genus Lobelia.*
37. Lawrence Jefferson Trotti, *On Gastritis.*

V. NORTH CAROLINA.

38. Lawson Marshall Caldwell, *On Pneumonia Biliosa.*
39. Thomas Harris, *On Dysentery.*
40. William John Miller, *On Syphilis.*
41. Richard Henry Norris, *On Dyspepsia.*

VI. ALABAMA.

42. Turner Delleny Bell, *On Hydrocele.*
43. David Henry Mason, *On Debility of Action in Inflammation.*
44. James George Maull, *On Acute Hepatitis.*
45. Hiram A. G. Roberts, *On Inguinal Hernia.*

VII. GEORGIA.

46. Elias Beall, *On the Bandage.*
47. Robert Jones Lawrence, *On Cholera Morbus.*
48. Nathaniel Newton Smith, *On Inflammation.*

VIII. LOUISIANA.

49. WILLIAM AUGUSTUS FICKLIN, *On the uses of the Bandage.*

IX. MISSOURI.

50. JOHN HALDERMAN, *On Dysentery.*

X. MARYLAND.

51. STEPHENS RITTENHOUSE BEATTY, *On Congestive Bilious Fever.*

The honorary degree of M. D. was also conferred upon THOMAS P. SATTERWHITE of Lexington, Kentucky, and CHARLES DOUGLASS of Tuscumbia, Alabama.

C. W. SHORT, M. D. DEAN.

TRANSYLVANIA UNIVERSITY.

MEDICAL DEPARTMENT.

THE OFFICERS OF THIS INSTITUTION ARE

BENJAMIN WINSLOW DUDLEY, M. D.
Professor of Anatomy and Surgery.

CHARLES CALDWELL, M. D.
Professor of the Institutes and Clinical Practice.

JOHN ESTEN COOKE, M. D.
Professor of the Theory and Practice of Medicine.

WILLIAM HALL RICHARDSON, M. D.
Professor of Obstetrics and Diseases of Women and Children.

CHARLES WILKINS SHORT, M. D.
Professor of Materia Medica and Medical Botany, and Dean of the Faculty.

JAMES BLYTHE, D. D.
Professor of Chemistry.

JOSEPH SMITH WALLACE, M. D.
Librarian.

Two full courses of Winter Lectures are required by the laws of the Institution, before a student is permitted to present himself for examination, as a candidate for the degree of Doctor of Medicine, unless he shall have attended one full course in some other respectable school, or shall have practised Medicine creditably for the term of four years; in either of which cases

one entire course of Winter Lectures, will entitle the candidate to examination.

The Winter Session commences regularly on the first Monday of November, and terminates on the first Saturday in March; during which time each Professor lectures daily, Sabbaths excepted.

The expenses of a full course of Winter Lectures, including the Matriculation and Library ticket is fixed at *one hundred dollars*, viz: $15 for each ticket, except that of the Professor of Anatomy and Surgery which is $20, and $5 for the Library and Matriculation. From those candidates who graduate an additional fee of twenty dollars is required.

After attending two full courses of Winter Lectures, or after having graduated in this Institution, the pupil has the privilege of attending all the public lectures of the different professors gratuitously, for any length of time.

The Medical Library now contains upwards of *three thousand volumes*, comprising all the rare and standard works on Medicine and the collateral branches of science, and is still constantly increasing by the addition of many of the periodical publications of Europe, and all those of America; as well as most of the recent works on the profession, as they appear either at home or abroad. To this extensive collection the Medical Students have free access, and are privileged to take out two volumes at a time. The Library is opened as a reading room every day; and until 10 o'clock every night, during the winter, it is comfortably warmed and lighted.

"The Lexington Medical Society," holds regular meetings every week throughout the winter, and monthly during the summer. At these, communications are read by the different members on subjects appertaining to Medical Science, and free discussions are elicited by them. The Medical Professors occasionally attend, read papers, and partake in the debates.

An extensive Lunatic Asylum, situated within the limits of the town, affords at all times a variety of interesting cases, presenting every modification of mental derangement. Of this Institution the Medical Professors are, *ex officio*, the attendants and consulting physicians; and to the practice of the house all Students of Medicine have free access.

In addition to these sources of instruction, the Medical Faculty of the School, at the request of those young gentlemen, who, on account of the advantages to be enjoyed in Lexington and the healthiness of the town, continue here throughout the season, have heretofore delivered and will continue to deliver a summer course of lectures on the different branches of Medical Education.

The Student of Medicine may also, if he choose, avail himself of the advantages of the private instruction of any one of the Medical Professors, by entering his office, witnessing his practice, preparing his prescriptions, using his books, &c. at an expense not exceeding fifty dollars a year.

As gentlemen at a distance frequently apply by letter for information respecting the expence of attending lectures in Transylvania University, it is thought advisable to make the following statement.

FOR WINTER LECTURES.

Tickets to six courses of Lectures with Matriculation and Library Ticket, - - - - -	$100 00
Seventeen weeks board, lodging, washing, fuel and all other incidental charges, from $2 00 to $3 00 per week, average $2 50, - - -	42 50
	$142 50

FOR THE SUMMER.

Boarding, &c. is lower in summer; for 35 weeks less than - - - - - - - -	80 00
Summer course of Lectures with use of Library, -	50 00
	$130 00

MEDICAL HALL OF TRANSYLVANIA UNIVERSITY

This building, a vignette view of which is seen on the cover of this Journal, has been erected by the private munificence of the citizens of Lexington, during the last season.

The corner stone was laid with Masonic ceremonies on the 15th day of April; and the Edifice was completed and in read-

iness for the reception of the Medical Class at the commencement of the session, 1st of November.

In an excavation made in the corner stone, was desposited a glass-bottle enclosing a parchment roll, on which were written the names of the President of the United States, those of the heads of Department, the Trustees of Transylvania University, the Medical Professors, Trustees of the town, officers of the Grand Lodge who assisted at the ceremony, Building Committee, Architect, &c. On a marble tablet over the front door of the house is the following inscription.

COLL. TRANSYL. MEDIC.
FUND. A. D. MDCCCXXVII.

Though plain and unostentatious, the style of its architecture is chaste and neat, its execution is solid and substantial, and its interior arrangements are of the most convenient, comfortable and commodious kind.

The Basement story of the building is chiefly appropriated to the Chemical Professorship, and contains a lecture room, forty-five by fifty feet in dimensions, in which the seats and lecturing stand are arranged in the best manner for perfect vision, a lobby, an anti-room, a chemical laboratory well supplied with all necessary apparatus, and a dormitory for a resident pupil who acts as Librarian.

On the second floor is another spacious Lecture Room, fifty feet square; an extensive library room, fifty feet by twenty-five; janitor's apartment, &c. It is contemplated during the ensuing summer to fit up another room in the house for the Museum, which will then be exhibited in a gallery seventy-five feet long by twenty wide.

These, in connexion with the very handsome and commodious anatomical amphitheatre which was built during the preceding season, together with its preparing and dissecting rooms, present a suit of lecture-rooms, apartments, &c. not surpassed in point of excellence of light for demonstration, or in ease, comfort and convenience to the pupil, by any similar institution in America. The whole is situated in a pleasant and central part of the town, easily accessible from the chief boarding houses, in the worst weather.

LEXINGTON MEDICAL SOCIETY.

CHARLES CALDWELL, M. D. *President.*

ROBERT C. HOLLAND, M. D. *Vice President.*

WILLIAM M. GWIN, M. D. *Chairman.*

WARREN FRAZER, M. D. *Secretary.*

JOSEPH S. WALLACE, M. D. *Treasurer.*

Regular meetings of the Society are held every Friday night during the Winter, and on the last Friday of every month during the Summer.

LEXINGTON LUNATIC ASYLUM.

JOHN W. HUNT, *Chairman.*

JOHN BRADFORD,
WILLIAM MORTON,
RICHARD HIGGINS,
JOSEPH LOGAN,
} *Managers.*

S. THEOBALD, M. D. *Attending Physician.*

BENJ. W. DUDLEY, M. D.
CH. CALDWELL, M. D.
JOHN ESTEN COOKE, M. D.
WM. H. RICHARDSON, M. D.
CHARLES W. SHORT, M. D.
} *Consulting Physicians.*

ANDREW M'CALLA, *Stewart.*

THE

TRANSYLVANIA JOURNAL

OF

MEDICINE

AND THE ASSOCIATE SCIENCES.

VOL. I. AUGUST, 1828. NO. III.

ORIGINAL COMMUNICATIONS.

ART. I.—*A Valedictory Address delivered in the Chapel of Transylvania University, to the Medical Graduates at the Commencement on the 12th of March*, 1828. By CHARLES WILKINS SHORT, M. D. Dean of the Medical Faculty.

(Published by request of the Class.*)

GENTLEMEN GRADUATES,

You have now received through that official source,† designated by the proper authorities for the purpose, the highest honour which the Trustees and Medical Faculty of Transylvania University have it in their power to bestow; and having reaped that reward in the field of Science to which your la-

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*Dear Sir, In compliance with the wish of the Medical Class, we would request of you, a copy of the Valedictory Address to the Graduates, for insertion in the Transylvania Journal of Medicine &c.

Respectfully,

N. N. SMITH, of Georgia,
W. M. GWIN, of Tennessee,
D. H. MASON, of Alabama,
} Committee.

PROFESSOR SHORT,

MARCH 13th, 1828.

† The Presidency of the Institution being at the time vacant, Professor Dudley was appointed by the board of Trustees to preside on this occasion.

bours and your industry have entitled you—having won that prize to whose acquisition you have so long and so ardently aspired——in whose pursuit you have together so earnestly run the race of emulation, you are about to separate, and parting in a few minutes on this threshold, you are on the eve of bidding to us and to each other, some a long, and others a last farewell.

On this interesting occasion which fills my bosom with emotions scarcely to be suppressed, allow me, as the delegated organ of my worthy associates, your late esteemed preceptors, to detain you for a moment, and but for a moment. The few observations which I have to offer you are brief and desultory, but I hope they will not be irrelevant to the occasion.

The standing which you have heretofore sustained before us has been that of pupil, and although in this capacity you have found the life of a student not without its cares and anxieties, its toils and difficulties, yet these have one by one yielded to the "labor improbus" of perseverance, and having surmounted them all you now assume a new attitude before us. Yet credit me, Gentlemen, when I assure you that the cares, anxieties, troubles and difficulties inseparable from your profession, are not at an end; for as those of the student, when passed over, wane and fade in the distance, those of the practitioner crowd on the vista before you.

The station which you are about to assume in the ranks of society is one of awful responsibility. To your hands will shortly be confided the lives and destinies of your fellow citizens;—the doating husband will repose his hopes on you for the restoration of a beloved companion—the fond wife for that of her only stay and support on earth—the affectionate parent for his only child—the child for the venerable and endeared parent: in short the tenderest ties which bind the human family together, and which cannot be severed but with the convulsive agonies of nature, will hang suspended upon your exertions; and when the demon of pestilence with epidemic rage, sweeps over the land with the besom of desolation, blighting the fairest face and withering the stoutest form, the cries and supplications of a whole community will follow you; the hopes and fortunes of thousands will rest on the en-

ergies of your mind, the efficiencies of your arm. To enable you to meet, encounter and overcome these appalling exigences—exigences which none but a madman would encounter without preparation, has been the object of that intercourse between us, which having existed for a term is now dissolved, and thrown upon your own resources, you now launch upon the tempestuous ocean of life.

And here permit me to remark that too many of those who, in the days of their pupilage, have manifested the most devoted fondness for study; who have evinced the sincerest attachment to science for its own sake; and who in consequence thereof have made the most respectable attainments, when they engage in the busy scenes of active life, forget or grow indifferent towards that mistress whom they have so long and so ardently wooed.

Knowledge naturally draws to itself, by ties of strong attraction, all those who like yourselves have been earnest in her pursuit; but by imperceptible degrees, the absorbing duties of life, the imperious avocations of professional engagement, cool this ardour and lessen this attachment. Hence it has followed that many, who have left the academic shades of Science, and the lecture-halls of Medicine, with the highest expectations entertained by others of their future eminence and fame, have too soon disappeared in the shadows of obscure mediocrity, or been lost in the darkness of oblivion. Let not this, we entreat you, be your fate; for although you have honourably gained that object of your immediate desires, to which you have so laudably aspired; and although the ordeal of examination, which you have awaited with such natural anxiety, and have passed with such credit, is over; yet to the eagle-eye of praise-worthy ambition, are arrayed in brilliant perspective before you, laurels of more difficult attainment, in quest of which you must encounter trials of less partial and more penetrating scrutiny. The malicious envy of rivals—the scrutinizing investigation of the public—the detraction of enemies—the calumny of the world may await you. But in return for these you are offered honours and distinctions, wealth and enjoyments. To gain these, fear not to grapple with those opposing obstacles. In this struggle where the prize is so important,

and the victory so honourable, let not the faint-hearted mar the progress of the bold. Mount on with courteous alacrity and cheerful fellow-feeling, and having left immeasurably behind you your less venturous compeers, you will have gained an eminence whence your light will shine in comparison with theirs, as, contrasted with the sickly glimmerings of a midnight taper, beams the broad effulgence of a noon-day's sun.

To gain these heights of enviable distinction, we urge you to be students still. However engrossing your duties, however pressing your engagements, devote some portion of every day to reading, study and reflection. Collect around you, as opportunity may offer, those fathers of the profession who have bequeathed to their successors the rich legacy of their experience and observation. Make their writings "a lamp to your feet, and a light to your path," whose illumination will richly reward you for the most studious investigation.

"Nocturna versate manu, versate diurna."

But whilst you call to your aid the intellectual labours of your predecessors, be not too implicitly directed by them. Pin your faith to the sleeve of no man, dead or living. The operations of nature, alike in all portions of the world and in all ages of its history, are as open to your investigation as to theirs. And whilst from the written observations of some—the oral declarations of others, and the instructions of nature as revealed to yourself, you draw your inferences on all subjects, be the motto of your investigation,

"Nullius addictus jurare in verba magistri."

Having yourself derived pleasure and instruction from the lessons of others, it will become you in your turn, to communicate the results of your experience and observation to them and their successors. Cultivate then a habit of writing and composition, and with this object in view, note down at the time of its occurrence every thing worthy of record in the way of your profession. By this means you will gradually become possessed of a store of facts upon which you may afterwards draw with most material advantage, and with far greater certainty than upon the most retentive memory. That strict, unswerving and religious regard for truth, which should be the prime object in every in-

vestigation, but illy comports with those inferences which are drawn from the far-fetch'd, distant recollections of memory alone, too apt, at all times, to be perverted by partial views or favourite hypotheses.

A Periodical Journal emanating from your *alma mater*, devoted to her interests and to the cause of science, is now opened before you. Through its pages, as a common medium of intercourse between you, you may communicate one with another, and the results of the experience and observation of any one of you, may be speedily disseminated among all the rest, and throughout the Union.

Cultivate assiduously at all times, by correspondence and personal intercourse, the society and acquaintance of those, from whom you are likely to derive information; but avoid with far greater caution than you would the pest-house of infection, the Bœotian air of sloth, idleness, and dissipation. Labour in your vocation as one labouring for his life, and whatever "your hands find to do, do it with all your might." Whether your bodies be actively employed, or at rest,—whether riding or walking,—whether by the sick-bed or the fire side,—in the chamber of affliction or the social circle,—at the "house of mourning or the house of feasting," let your minds be never unemployed. Be at all times ready to obey the summons of the sick, whether it call you to the seat of opulence and ease, or to the hovel of misery and wretchedness. Be ever willing to pour the fruit of your earnings among the rich, into the lap of poverty—to sooth the widow's sorrow, to dry the orphan's tear.

Scorn as you would the most polluting stain, abhor as you would the very forfeit of your honour, that mean and dastardly disposition which would induce you to supplant a professional brother, by insidious detraction, or by officiously interfering in his business. Despise as contemptible and unworthy of your acceptance, that popular favour which is bought, by sectarian influence or political partyism. Spurn from you as derogatory to your high vocation, that truckling subserviency offered to your aid by tattling gossips, whether male or female. Cast from you as meretricious trappings, all those adventitious decorations,

which the misguided zeal of friends, or the ever veering tide of popularity may heap upon you. Rest your claims to popular applause upon more solid and durable foundations—upon your real merit and your professional acquirements. Fear not to have your doings proclaimed from the house-tops; and in all your conduct, and in all your practices, be guided, as your polar star, by that high minded honourableness which should be the characteristic of our profession.

That profession is often accused, and with apparent justice too, of fostering a jealousy among its members, always injurious to happiness, and not unfrequently subversive of reputation; which unfortunate propensity, I hope the rising scions of that body which I have now the pleasure of addressing, will have the magnanimity to dispel from their bosoms. "Let us be excited by a laudable spirit of emulation, not the narrow jealousies which distinguish those, who, conscious of their own inferiority, dread every approach towards reputation in others. All who pursue the same science should labour together for the common good; every degree of assistance, every deserved commendation which they give to each other, is the surest means of advancing their own fame; while every atom of usurped importance, if it does not immediately cover its vain possessor with opprobrium, is almost certain to be deducted, with interest, from his character, by a discerning and impartial public."[1]

Finally, Gentlemen, let me conjure you as cherished alumni, not to be unmindful of your alma-mater; within whose bosom you have sought, and I trust you have not sought in vain, for those intellectual stores upon which you may profitably draw to the latest period of your lives. Whilst you receive at her hands, that testimonial of your qualifications, and that passport to the confidence and esteem of your fellow citizens, let it prove also, a memorial of those hours, (perhaps the happiest of your lives,) which you have spent within her walls. And now, in bidding you farewell, she earnestly prays for you a speedy and a safe return to the bosom of your families and friends—that you may

1 Sir J. E. Smith's Address to the Linnean Society of London. Lin. Trans. Vol. 1.

soon obtain and long enjoy all that reputation and felicity which you deserve, and when, after a life well spent, and distinction richly earned, you close your career on earth, her genius will drop the tear of sorrow, whilst, proud of the name you have left behind, she will exultingly exclaim, Ecce filios meos! Behold a son of Transylvania!

ART. II.—*An Essay on Milk-sickness.* By LUNSFORD PITTS YANDELL, M. D. of Murfreesborough, Tennessee.

IT has long been a favourite belief among medical philosophers that the pestiferous epidemics which, from time to time, have visited the earth, have afflicted the inferior order of animals as well as man; and that they have been preceded, accompanied, or succeeded, by extraordinary commotions in the planetary system. The atmosphere has been supposed to be loaded with the seeds of disease, which fixing themselves in domestic animals, in birds and in fishes, spread desolation and death over the whole face of animated nature. Credulity and superstition have doubtless had their share in creating this belief, and the influence has perhaps been exaggerated; but it is a fact that of the distempers mentioned by Homer, Thucydides, Lucretius and Dr. Pym, a characteristic feature was, that "mules first and dogs they struck," and afterwards man himself. It is no objection to this opinion that while some species of animals languish and die, others appear to prosper and multiply as in an element peculiarly congenial. Rotation is known to be the order of nature. One race of animals perishes and vanishes away to furnish subsistence to a succeeding and different species.

The disease which it is our design to describe commences, not indeed, like the distemper of the poet, sent by the gods, upon 'mules and dogs;' but its origin is always among herbivorous animals. Man is never affected except in the second instance, and then through some of the animals which minister to his comfort.

Milk-sickness is confined, so far as we are informed, to the United States, and has not yet found a place in any system of nosology. Its character is, in fact, but imperfectly understood, and the cause from which it springs is veiled in uncertainty. Additional facts are still wanting, greater amplitude of discussion is required, to place the subject on incontestable ground. Without a hope of being able finally to settle the question, it is a sufficient apology for our taking up the subject at this time, that wherever the disease prevails it is singularly fatal, and that we hope to furnish some facts not heretofore published.

Local in its character, this disease prevails only in particular districts of country,—in regions marked by some peculiarity of feature, and generally, we think, in the vicinage of mountains or elevated land. So far as our acquaintance extends, it is limited to the middle, southern and western states. It is to be found on the Yadkin river, in North Carolina, and in different parts of Georgia and South Carolina. Some sections of Virginia and Kentucky present it as an annual complaint. The Sequache valley, one of the most salubrious and delightful spots in our state, is subject to it. It prevails in Franklin county, in the vallies of the Cumberland mountain, and among the *Mill-stone knobs* of Sumner and Smith counties. Our remarks will be confined to the disease as it is presented in the latter place, this being the source from which we have derived our principal information, referring to other places only for illustration.

The Mill-stone knobs are the termination of the hills dividing Barren from Cumberland river, among which the different branches of Goose creek take their origin. They rise two or three hundred feet above the level of the Cumberland, with sandy, sterile summits, and stretching towards the south, terminate, within a few miles of the river, in a rich and beautiful country. Covered as these hills are with the profusion of grass and herbage peculiar to a fertile soil and southern sun, and from their abruptness, being sparsely populated, they are the resort of the cattle of the neighbourhood. Like most small streams in this climate, the branches of Goose creek run only in the winter and spring, and early part of summer, leaving during the hot season

masses of stagnant water to the influence of the sun; and, as might be anticipated, the inhabitants are the subjects of bilious disorders. No part of our state suffers more seriously from these visitations. Annually, diarrhœa, cholera, dysentery and fever, in all their grades and changes, are as regular in their appearance as the return of the seasons. Cases occur, upon these water-courses, which border closely upon the malignancy of yellow fever.

Milk-sickness prevails, for the most part, during the season of vegetation. The first years of our life were passed on Goose-creek in the neighbourhood of the disease, and the cases which we remember to have observed, appeared during the summer. Dr. Sharpe remarks that it is most common during the months March, April, May, September, October and November.* Cases occasionally occur in winter, but they are rare. My father, the late Dr. Wilson Yandell, in a letter to me on the subject, remarks, "it is most prevalent, if my memory serves me, from the latter part of May till after the autumnal frosts, scarce prevailing in winter. About the first of June, if I am not mistaken, it is worst, though very dreadful throughout the summer when cattle are permitted to run at large." Dr. Thompson, a physician of this county, of great practical skill and accuracy of observation, in a letter to me says, "the season of the year at which the disease is most prevalent, is the fall, after vegetation has been mostly killed; about the time of white frosts, and from that time till the cold of winter becomes constant. The next worst time is about the appearance of vegetation in spring; though cattle sometimes suffer if the winter is mild, after unusually warm spells, in December, January and February." Writing from memory alone, unassisted by notes, there is a slight discrepance between the accounts of the latter gentlemen as to the season during which it is most fatal. Accident might have thrown more cases in the way of one than the other at a particular season, or cases occurring at one time might have impressed them more than others at a different time, and thus there would be a

*Medical Recorder, Vol. vi. p. 264.

disagreement; but both of them agree with Dr. Sharpe, that the disease belongs to the period of vegetation, and of the cases on record a majority occurred in summer. Of those mentioned by Dr. Sharpe the two first appeared in June, two in May, and one in April, one only existing in winter; a chronic case, which had endured through two or three seasons.* If it is less prevalent during mid-summer and the last of the hot season, it is because cattle at this time are confined to pastures.

The disease attacks alike the aged, the middle aged and the young, and unlike most maladies, seems regardless of the partition wall which nature has erected between the different classes of animals. Cattle and sheep are continually its victims when not confined to their enclosures. Deer are often found dead among the hills where the poison is supposed to exist, and their flesh imparts disease to animals using it as nutriment. Often when pursued in the chase their strength fails, and they are taken in an unnaturally short time, owing to disease; and the experienced huntsman, under these circumstances, refuses to eat them. Wild turkies inhabiting the Mill-stone knobs are frequently found unable to fly. Opossums, raccoons, foxes, wolves, and other wild animals of prey, are often found dead near the carcases of cows and sheep. Buzzards and carrion crows die in immense numbers about the putrid bodies of cattle. "Nine of the cattle of Mr. Cathey," (as my father informed me) "having suddenly died of the poison, these animals were attracted in great numbers, and repairing to a branch hard by for drink, after their fatal repletion, died in such numbers that, a freshet shortly afterwards occurring, they were floated down so as to make dams across the stream." Hogs and dogs are its common victims when the bodies of poisoned animals are not burnt, or protected from them by an enclosure. A petition was presented to the last legislature of this state praying the passage of a law fining all persons who should be guilty of a neglect to burn or secure the carcases of animals under their eye, supposed to have perished from the poison. Even poultry have been known to suffer with the disease from feeding upon poisoned animals dying within their reach; while calves, colts,

*Med. Record. loc. cit.

and lambs are its most frequent subjects, imbibing the malady from the mother's milk.

The cause of Milk-sickness.

"*Hic labor extremus*"—here we enter upon contested ground—and here, as in too many cases where medicine is concerned, we are compelled to acknowledge that the nature, and even name of the offending agent '*atra caligine mersa*'. The opinions started on this subject are four:

1. That it is a *mineral poison*, imbibed with the drink;

2. That it is the same poison, suspended in exhalation by the sun, during the day, and deposited upon herbage, with the dew, at night;

3. That it is a species of *bilious disorder*—originating in a cause common to it and autumnal fevers;

4. That it is a *vegetable poison*, taken in by cattle with their food, and imparting its deleterious qualities to their milk and flesh. The last is the opinion which we maintain.

To the first opinion we would object, that if a spring or stream of such poisonous waters, existed any where in these hills, it must long since have been discovered by some of the many labourers who have resorted thither to procure mill-stones; or by persons who, in the pursuit of pleasure or business, have wandered over every part of their summits. Running as such a stream would, some distance, and mingling its waters with other streams, its deleterious qualities would become widely diffused, and in a short time generally known. Such is not the fact; no stream or fountain is suspected. And, virulent as many of the mineral poisons are, and rapidly as they destroy life, we are not yet acquainted with one capable of imparting its qualities to the flesh and secretions of the animal poisoned, to such a degree, as to render them detrimental to other animals using them as food. This objection applies with equal force to the second opinion; and, it may be continued, the symptoms are not precisely those which attend poisoning from any known mineral. Besides, if such an exhalation existed in this country,—as of arsenic, or any other poison —which descending with the dews of the evening was fixed on vegetables, man himself, from eating fruit, cabbages, &c., would

become, in some cases, directly its victim;—a circumstance which, so far as we are informed, has never yet occurred. Cultivated pastures, in this case, would not eradicate it; a hedge or fence would not exclude it; but, floating in the atmosphere, it would descend alike upon herbs surrounded by an enclosure, and those which grow in the unreclaimed woods. But it is a fact familiar to the old residents of Goose-creek,—and marked because it leads to a salutary observance—that ground in which cattle contract the disease may be converted into safe pastures by sowing it in blue-grass, timothy or clover.

The third opinion, which, of all the four, is least reconcileable to the majority of unprejudiced believers, which appears most paradoxical to those who have seen their cattle die of an anomalous disorder, and their families sicken and perish from the use of their milk or flesh, has found many ingenious and able advocates. Its fallacy will be made out by the facts adduced in support of the last opinion—that it is of vegetable origin.

The cattle of one family are permitted to frequent the woods; they return home at night, apparently in health, it may be; the members of the family partake of the milk, and are soon attacked with sickness at stomach, vomiting, and other symptoms of gastric derangement, and perhaps some individual of it perishes. The calf, meanwhile, is taken with trembling, violent thirst, and rigidity of the extremities, of which it dies. The cow, all the time, which imparted the disease may be, to all appearance, in good health—an appearance which severe exercise, or simply retaining her milk, shews to be delusive. In returning home some of the cattle have perhaps died at the first stream on their way after drinking copiously; whilst others, scarcely able to reach home, manifest unequivocal symptoms of disease, teaching the family to beware of their milk.

While this is going on in one family, another, living in the same neighbourhood, inhaling the same atmosphere, drinking the same water, and faring upon the same diet, but with the precaution of confining their cattle to cultivated pastures, remains healthy. This was a circumstance of every day occurrence in the early times of Goose-creek, when the inhabitants were more in the habit, than at

the present day, of permitting their milk-cows to wander abroad. It is a fact of perfect notoriety, that persons living in the neighbourhood where the poison prevails may indulge in the use of milk, butter and fresh meat, and yet remain free from disease, provided the cattle be enclosed in clover, or other grass pastures. But if they be suffered to run at will, or even if the pasture-ground be enlarged by taking in more woodland, disease, and death often, are the consequence. Upon again excluding the woodland, which contained the poison, and confining the cows to the soil set with grass, health may be, as in many such instances it has been, again restored. Dr. Thompson's letter to me furnishes a case directly in point. "Robert M'Neely, his wife, and four children died within a week, under circumstances which left no doubt on the minds of any, that their death was the result of using poisoned milk. He had lived a number of years at the same place, and enjoyed good health, except that he was subject to attacks of humoral asthma. Having escaped so long he became careless, and during a busy season of hay-gathering his cattle got out, and were not attended to for several days. The first milk taken after their return from the woods produced all the mischief. The effect followed its use almost immediately. All the family died except the two youngest children—one an infant at the breast, and they were saved with difficulty."

Is it likely that any form of disease having its origin in *malaria*, would deprive the wild turkey of its wings, and the deer and fox of the use of their limbs? Homer's disease went not so far. And even if it were a febrile disease which proved so fatal to cattle, the use of their flesh would not be detrimental to carnivorous animals; as hundreds of well authenticated cases attest the flesh of poisoned cattle to be. Calves which perished from sucking the milk of the cow have imparted disease to dogs and buzzards feeding upon their flesh.

In the early settlement of Goose-creek, when the face of the country was covered with cane and pea-vine, and there was, consequently, no scarcity of food for cattle, milk-sickness was comparatively unknown. As the country became populated and provisions grew scarce, the cows being forced to be less elective in

their food, it increased to an alarming extent. But in modern times, since pastures have become more common, and the inhabitants are more in the habit of confining their stock, it is again become a rare disease. Such is not the progress of marsh miasmatic disorders in this country.

In the Sequachee valley, one of the most salubrious regions in the western country, where bilious fever is almost unknown, this disease prevails, and is contracted by cattle on the sides of the mountain. When our species become its subjects it is from partaking of the milk or flesh of poisoned animals. This is always the case. In every instance it may be traced to the use of this class of articles. Sometimes there may be obscurity and doubt, but strict inquiry will always trace it to this origin. Mrs. Jones, of Sumner county, laboured under the complaint without knowing the source whence she derived it. Upon the suggestion of Dr. Sharpe,* the cow which afforded the family milk was suffered to go unmilked, and in a few days fell sick of the complaint and died. This is a peculiar feature of this poison, that retaining the milk in the udder causes the cow to suffer with the disease, while its regular abstraction, at short intervals, has frequently the effect of procuring her escape.

Drunkards are said to be less liable to milk-sickness than persons not given to intemperance. This is not a feature of bilious disorders. Nor are its symptoms the same as those attendant upon the latter complaints. The tongue is often smooth and dry, or if coated at all, it is with a tough white mucus. No pain in the head, spine, or region of the liver attends it, and it runs its course much more rapidly than any bilious disease except cholera. It is not marked by the regular paroxysms incident to fever, but pursues a steady, uniform, unchecked course, either to dissolution or a favourable crisis.

Finally, experiments have been made, and facts are numerous, proving in the most direct manner, the conveyance of the disease from one animal to another by milk. Dr. Thompson furnishes me a strong case. "A farmer's cows, four in number, broke out of

*Med. Record. loc. cit.

their enclosure, and were in the Mill-stone knobs about thirty-six hours. When driven home some of the milk was drawn from them and set aside that its appearance on standing might be observed; the calves were permitted to suck the rest; they were hungry, the udders of the cows full, and consequently, their repletion was copious. One of the calves was taken sick while sucking and died in a few hours. All the others died in a day or two. Three of the cows died; one which was sucked by two calves, both of which died, recovered, after severe disease, in the course of which all her hair dropped off. The milk which was set by was given to several domestic animals, as cats and dogs—all of which died, if I am not mistaken; some I am confident did, and all were diseased."

It has been objected to this disease being of vegetable origin that it prevails in winter when vegetation is destroyed; and that relapses are common in it, as well as in fevers; that some members of a family are diseased while others escape; and that communities fearing to eat milk and butter, nevertheless send them to market, where they are used with impunity.

That it prevails rarely in winter we have already shewn, and then it is in warm weather when cattle may find many vegetables still verdant.

We know of no reason why relapses should not be incident to milk-sickness as well as to other inflammatory diseases. Gastritis and enteritis may be brought back when partially cured, by exposure, or imprudence in diet. It is one of the peculiar phenomena of our disease that its subjects rarely perfectly recover, but remain, through life, feeble, incapable of severe exercise—trembling when fatigued, and subject to a recurrence of gastric derangement after exposure.

If some members of a family escape while others suffer with the disease, it is because all are not alike exposed to the noxious cause.

Butter is doubtless often sent to market from the regions of country in which the disease prevails, but it is the product of cows which have been confined to safe pastures, and are without disease; for we will not believe that there exists in our country a

community so dishonest as to send butter to their neighbours which they know to be poisonous. Cows generally manifest the disease so unequivocally that there is little danger of using the milk, and if it is once used, and disease results, the cream is thrown away, and no butter is made from it. And as respects unsound beef, the objection has no force; for it is a fact perfectly notorious, that animals labouring under the complaint, though it be in a latent condition, will not bear exercise. Horses apparently healthy while at rest in their pastures, become soon exhausted, manifest marks of disease, and often die, if put into harness, or under the saddle. Cattle feeding upon the knobs, in seeming health, have been frequently destroyed by the fatigue of walking home; and consequently no diseased beef could be driven to a distant market.

What the cause of this truly anomalous malady is, in the present state of our knowledge it is impossible to pronounce. We have tried to shew that it is vegetable; and like the disease which it produces, in character it must be unique. Some writers have gone so far as to designate the vegetable; but upon what authority we do not know. We do not think that it has ever been discovered; nor is this strange, for it has never been sought after by any one possessing the requisite amount of botanical knowledge.

The symptoms of the disease in the lower order of animals are languor, great thirst, constipated bowels, universal tremors, tossing of the head from side to side, great rigidity of the muscular system; a peculiar odour of the milk, laborious respiration, the breath offensive to the bystander. In man they are analogous. After the use of milk, butter, or recently slaughtered meat, in a shorter or longer time, the individual is attacked with a distressing sense of burning in the epigastrium, followed in a few days, generally in a few hours, with vomiting. The sense of the burning is often compared by the sufferer to fire. Thirst insatiable. These symptoms are uniform, pathognomic, and continue throughout the complaint. The bowels are constipated; sometimes incorrigibly so, and when this is the case, the patient falls a victim to the disease on the third, fourth, or at farthest, the fifth day. The pulse at first natural, becomes in the sequel small, tense, vibratory, and

often irregular. The epigastrium becomes tender to the touch. The skin is of irregular temperature—the body being hot, and the extremities cold. The patient is distressed with a sense of burning in the palms of the hands and soles of the feet. The tongue is clammy, and covered with a white tough mucus; or is dry, red, and shining. Great prostration attends from the beginning. No regular remissions or exacerbations—no delirium, no pain in the head or back. Drinking aggravates the nausea and other gastric symptoms. A symptom much relied on by those conversant with the disease is an odour of the patient's breath, *sui generis*, which they cannot describe.

The symptoms of the chronic form of the complaint are a slight burning in the stomach, continued and distressing; occasional vomiting; general debility; trembling upon slight exercise; difficulty of breathing after moderate exertion; rigidity of the whole system; costive bowels; giddiness of the head; countenance sallow; intellectual dulness. This form of the disease results from a small dose of the poison, or from an imperfect cure of the acute kind.

Treatment. Venesection is not so valuable a remedy as might be anticipated, from the character of the symptoms. This is possibly owing to its not being resorted to in the first stage of the disease, since patients rarely apply for medical aid until it has made considerable progress. Opportunely had recourse to, previous to the stage of collapse, which rapidly supervenes in this disease, and while the inflammatory symptoms are yet clearly marked, it is decidedly beneficial. The pulse here, as in inflammation of the stomach from other causes, must not constitute the criterion by which we are to judge of the necessity for bleeding. We must be governed more by the stage of the disease, the strength of the patient, the obstinacy of the vomiting, the pain and burning in the stomach, and the tenderness of the epigastrium.

Cathartics are esteemed by the most experienced practitioners, the sheet-anchor in this disease. Calomel is to be preferred on account of its weight, as well as its active purgative qualities. It is to be given in six or eight grain doses once in four hours,

and to be assisted by stimulating enemata, until free catharsis be produced. When so fortunate as to fulfil this indication the patient may generally be considered out of danger. The bowels must be kept soluble by castor oil, or salts and senna, until complete health is restored.

Blisters to the epigastrium are never to be neglected when the bleeding and the calomel have not the effect of allaying the vomiting. Sinapisms are also a valuable remedy. When the circulation is well balanced, the extremities being warm, cold water applied to the hands and head often produces great relief, sometimes stopping the vomiting as if by a charm. We witnessed this effect lately in an ordinary case of gastritis. The patient derived the most sensible and immediate benefit from immersing his hands in water just from the spring.

It is frequently necessary to cover the abdomen with blisters. The calomel must be used with a liberal hand till the bowels are acted on; and if ptyalism supervene, it is to be considered an auspicious omen. It is necessary to prevent the patient from taking too much drink, which should consist of cold coffee, or water off parched meal or toast-water. The preparations of opium possess no great efficacy in this complaint, aggravating in some instances, instead of allaying the nausea and vomiting. Mint-water has sometimes a good effect. Upon the whole, we would rely mainly on venesection, mercury, epispastics, and affusions of cold water upon the extremities.

The chronic form of the complaint is to be treated with calomel in minute doses, given to salivation, epispastics, castor oil, sulphur, and the alkalies. The latter class of remedies are of peculiar efficacy in this form of the disease.

The course indicated for the acute form, timeously adopted, and steadily persevered in, will generally terminate the disorder in from five to ten days; but it sometimes happens that a truce only is obtained; the patient is but partially cured, and after dragging out a miserable existence for a series of months, falls a prey at last, to the symptoms with which he was at first attacked.

Autopsical examinations have never been made on the human subject; but the symptoms of the disease in man and brutes be-

ing the same, we may infer that its ravages are likewise analogous. In post mortem examinations the stomach and first intestines of cows, have been found to bear the marks of inflammation in its various stages: they are often gangrenous, and uniformly dry and hard, often as if exposed to the fire. Their contents are also dry, evidencing diminished secretion. No traces of disease have ever been observed in any other organ, except that the lungs are sometimes preternaturally engorged with blood.

ART. III.—*Singular Cases.* By CHARLES CALDWELL, M. D. Professor of the Institutes of Medicine and Clinical Practice, in Transylvania University.

WE do not concur in opinion with certain writers and others, who indulge themselves in railing against what they are pleased to term "mere reasoning" in medicine, and contend that the only way to improve the profession is to add to it new individual facts, new remediate substances, or new cases of disease successfully treated.

If medicine be a science, it is made so by reasoning, i. e. by the exercise of the reflecting faculties of man, more technically called the faculties of relation; not by that of the individual or more isolated faculties; and if it be not yet a science, the sooner it is erected into one, the more honourable will it be to the possessors of it, and the more certainly beneficial to those who may become its subjects. In either case reason must be employed. If discarded, the entire possession is but a scheme of empiricism.

A fact, whether new or old, if it be not an element of a recognized principle, if it be not classified, is of little use.

Of a new remedy accidentally, or by mere experiment discovered, unless it be understood and administered on principle, the same is true. It is nothing but an insulated fact, of very limited influence. To give it weight and worth, it must be assorted and classed.

A new case of disease successfully treated, that is, from which the patient has recovered, is very often much less instructive, than another one in which he has died. If a patient recovers, on using a certain remedy, but no one knows why, no body is the wiser or the more skilful from the event. The remedy cannot be employed in another case, unless tentatively on the ground of mere supposition. But if its use be directed by principle, it can be varied and adopted to any analogous condition of diseased action.

On the contrary, a case of disease terminating unsuccessfully, is often fraught with excellent instruction, provided the cause of its fatality be understood. It leads to the avoidance or removal of that cause in future. But nothing is valuable in medicine, unless it be rendered so by principle and "reason." Every thing apart from these is unavailing or worse.

The most distinguished improvers of medicine are not those who have added to it the greatest number of facts; but those who have introduced into it the greatest amount of sound philosophy—those who, by classifying and generalizing facts already known, have established principles. Certainly the ablest teachers of medicine have been of this latter description. A fact may be, and very often is, discovered by accident, the discoverer being ignorant of its real value. Insulated, as to him it appears, it can scarcely be called valuable. He perceives facts and events, but not their relations. He is, therefore, no philosopher; and without the aid of others, can never materially benefit medicine. But the real philosopher, who looks at and understands the relations of things, takes up the fact thus discovered by an intellect of an inferior standing, examines it, compares it, throws it into its proper class, makes it an element of a principle, and by this process, augments in a tenfold degree, its usefulness.

The reporter of the following cases would not have thought himself justifiable in presenting them to the public, did he regard them only as matters of curiosity. But connected with principle, as they appear to him to be, he trusts they will not be viewed by the reader as altogether without value.

CASE I.

When a very young physician, he was called to a severe and threatening case of dropsy (ascites and anasarca) in J. D. aged about sixty-three, who had lived freely, worked laboriously, and been exposed to hardships. It was in the month of July.

The usual treatment, by diuretics, purgatives, and secretory remedies generally, was vigorously commenced, and faithfully persevered in, until the trial with these articles was believed to be perfectly fair. No salutary effect was produced.

A gentle ptyalism, continued for several weeks, was tried with as little benefit.

With a view to make, if possible, an impression on the system, and produce in it a new state of action, arsenic was employed, until it exhibited some of its characteristic effects. But the complaint remained untouched.

To throw secretory action on the surface, tartar emetic and the warm bath were resorted to with no higher advantage.

Under these embarrassing circumstances, the diuretic effect of water-melons, which were then in perfection and great abundance in the Philadelphia market, was recollected.

That the patient might have his spirits and confidence sustained, by the belief that he was still under the influence of "physic," and that, therefore, his case was not considered hopeless, he was directed to take, three times a day, six drops of water coloured with poke-berry juice, and to eat of water-melons, perfectly ripe, ad libitum. The prescription was delightful to him; and was complied with con amore. Nor was the effect of it less so to his physician.

The effect seemed magical. The urine flowed in quantities almost incredible. Absorption accompanied it, pari passu, until, in a few days, the hydropic effusion had entirely disappeared.

By proper attention to diet and regimen, the patient recovered, lived in health for several years, and ultimately died of thoracic inflammation. But the cure of dropsy was complete.

In this case is to be found an illustration and confirmation of a well known principle in therapeutics. A weak remedy is often successful, where a strong one has failed. Or, which amounts to

the same thing, the strength and efficacy of a remedy depend on its suitability, that is, its harmonious relation, to the condition of the system, at the time of its administration. It is altogether probable, that when the patient was first visited and prescribed for, water-melons would not have cured him. But by the varied treatment he had received, his system had been brought to a point of susceptibility at which they were the best secretory that could be administered. They were like a draught of cold water to a system excited by exercise, which is often the most powerful and certain sudorific that can be exhibited.

CASE II.

In the summer of 1817, Mrs. E. F. aged 32 or 33 was visited in Hamilton village, about a mile from Philadelphia. Her case was complicated and difficult to manage.

She was pregnant, feverish, had a stomach uncommonly irritable, and was labouring under a fourth attack of ascites. For the three former she had been tapped by Dr. Physick; and evacuated, on each occasion, of about four gallons of serum. The dropsical enlargement was as great now as it had been in either of the former instances. Nothing but her advanced state of pregnancy prevented a fourth operation.

As all antecedent attempts to excite absorption of the dropsical effusion had failed, nothing was now done for the removal of that affection. Every thing was directed to subdue fever and allay gastric irritation.

With a view to the latter object, after certain preparatory remedies, a large blistering plaster was applied to the epigastric region.

This having greatly mitigated, but not entirely removed the affection of the stomach, as soon as the irritated portion of the skin had ceased to discharge serum, another epispastic was applied to the same spot at the request of the patient.

The effect was alike surprising and delightful. The secretion of serum from the blistered portion of the skin, became copious beyond all precedent. It poured out in streams, passing ultimately through upwards of twenty folds of linen, a hair mattrass,

the bedstead sacking-bottom, and dropping down abundantly on the floor.

Accompanied by absorption from the abdominal cavity, it very soon removed the dropsical effusion. In the secretion of urine no augmentation, or change of any kind was produced.

The lady recovered, and was delivered, some time afterwards, of a healthy child.

The cause of such repeated attacks of ascites was a long-continued affection of the liver.

Since the reporter of this case left Philadelphia, the complaint recurred a fifth time; but refused, as he has been informed, to yield to blistering.

When he treated the patient, she was in a very feeble and highly sensitive condition. The skin, moreover, was exceedingly tender, on account of irritation, and the removal of the cuticle, by the preceding blister. These circumstances created a peculiar susceptibility, to which the irritation of the second blister was suited. Hence the unexpected and salutary result.

The skill and sagacity of the practitioner are most severely tested in his attempts to discover the precise relation that exists between his remedy and the condition of his patient.

CASE III.

From the writings of certain European physicians, into which the reporter of this case has lately looked, it would seem that their authors consider the cure of diseases arising from the suppression of habitual epistaxis, by leeches, as entirely new. That this is a mistake, appears from the following statement.

Miss A. T. aged about 17, had been subject, for several years, to vernal epistaxis. The discharges of blood had been at times very considerable; and were always preceded by a sense of fulness in the head.

In the spring of 1808, the hemorrhagy did not occur. A severe and most obstinate cerebral fever ensued. The headach was agonizing, accompanied by strong throbbing of the carotids, tingling in the ears, flashings of fiery light before the eyes, occasional delirium, and a distressing wakefulness which nothing

could subdue. To add to the malady, menstruation was suspended.

The antiphlogistic treatment was commenced with great vigour, and steadily pursued.

To copious and repeated blood-lettings from the arm, purging, nauseating doses of tartar emetic, cold applications to the head previously shaved, and a ptyalism of some continuance, were added cupping and leeching on the temples and occipital region, and ultimately a blistering plaster over the entire head—all to no purpose; the disease continuing with unabated severity. Hydropic secretion in the brain was seriously apprehended.

With a view to the production of artificial epistaxis, the membrane of the internal nares was repeatedly scarified with a lancet; but without any beneficial effect.

To the same part leeches were, at length, applied, with complete success. Although the amount of blood thus drawn, did not, perhaps, exceed four ounces, it removed the complaint, as by a charm; and the convalescence of the patient was uninterrupted and rapid.

This case illustrates and confirms the power of habit in organic action; a consideration which the disciplined practitioner will never neglect.

It was not the small amount of blood, drawn by the leeches from the internal nares, that effected the cure. It was the bringing back to the part habitual excitement which had been translated, for a time, to other organs. It was a metastasis of irritation from within to without; a progress which is always salutary; while that from without to within, is as constantly deleterious.

Has a fever succeeded the drying up of an old ulcer? To remove it, excite the ulcer to fresh secretion.

Has dyspepsia, cramp in the stomach, colic, or any other internal complaint occurred on the disappearance of a cutaneous eruption? Re-excite the eruption, on the same parts from which it retreated, and those affections will be removed.

Has the cessation of a hemorrhoidal discharge been followed by a thoracic or cephalic affection? Re-produce the discharge, as the most effectual mode of cure.

In like manner, the sudden disappearance of a long continued gleet has been succeeded by various affections, which called for its reproduction as the most efficacious and certain remedy. So powerful and important in the treatment of diseases, is the law of habit.

CASE IV.

As respects the power of the vaccine disease to prevent the small-pox; the reporter of this case was originally a sceptic. But the circumstances of the case did much to settle not only his opinion, but the opinion of all doubters who witnessed them, or to whom they were made known.

Having in the spring of 1805, vaccinated a child several times in the left arm unsuccessfully, he suffered himself to be induced, by the importunity of the parents, to inoculate it in the right; the last vaccination having been performed about six days before.

Visiting the child on the third day after inoculation, he discovered, on examination, that the virus of each disease had taken effect; and that the two pimples produced were of the same size. Without troubling the reader with an account of his reasonings, imaginings, and apprehensions on the subject, it is sufficient to state, that he was rendered uneasy by an utter inability to foresee the issue of an occurrence so novel. The parents were not a little alarmed, believing that their child was to be attacked by two diseases at once, the consequence of which must be its dissolution. To diminish their fears (for it was impossible to remove them) he gave them an assurance that for two constitutional diseases to exist at once, in the same system, was impossible; and that, therefore, the very worst to be apprehended was, that one of them might first prevail, and be succeeded by the other. He did not fail to add his presumption, that small pox, being the more powerful malady, would take the ascendency, and probably prevent the prevalence of the other. But circumstances, in a short time, convinced him of his mistake.

For six days the two pustules advanced toward maturity with an equal march. On the seventh and eighth days, that produced

by the matter of the small-pox was evidently stationary, while the other was assuming appearances of maturity. Slight symptoms of fever supervened, the vaccine pustule ripened completely, while the other retrograded slowly; and finally disappeared. Nor did the infant experience any inconvenience beyond what the vaccine usually produces. Small-pox was thrown out and the system rendered unsusceptible of it.

Stronger evidence of the preventive power of the vaccine disease than this case exhibits cannot be adduced. Several sceptics of the profession, who were invited to visit it, observe its progress, and learn its termination, had their doubts removed by it.

Yet it would, perhaps, be hazardous to contend, that a similar experiment with the two poisons would always terminate in the same way. It is quite possible, if not probable, that the various conditions of the human system might render it sometimes most susceptible of the one, and sometimes of the other. It is well known to be, in some conditions more and in others less susceptible than natural, of both.

In very hot and in very cold weather, vaccination often fails. Nor, in the extremity of seasons, does inoculation succeed so certainly as when the temperature is mild.

It need scarcely be added, that, when the vaccine disease has fairly prevailed, the testimony is ample, that it is, to say the least, as complete a preventive of small-pox, as small-pox is of itself. Second attacks of that disease are not unfrequent. And late occurrences in Philadelphia abundantly prove, that casual small-pox is much more likely to prove fatal to those who have been inoculated, than to those who have been vaccinated.

ART. IV.—*On the Chemical changes that take place in the Blood, during Respiration, and the causes of Animal Heat.* By JAMES BLYTHE, D. D. Professor of Chemistry in Transylvania University.

IN a former paper* we endeavoured to trace some of the effects produced upon the atmospheric air by *respiration*. In this paper we shall endeavour to trace some of the effects produced upon the animated system in general by the same process.

It cannot be too frequently repeated in the ear of the student of nature, *that nature is her own interpreter;* that is, she always gives some information as to her ultimate and occult purposes, by what she renders *visible* and *palpable*. Where she does nothing to indicate her purposes, to say the least it is idle to speculate. We therefore call the attention to this known fact. The blood passes from the heart to the lungs, and circulates through the vessels of those organs, and during that circulation is exposed to the influence of the atmospheric air, which the animal is constantly drawing into the lungs. Now here is a grand indication. Science would say, some great good is to be effected upon the blood, and probably through the blood upon the whole system by the constant approximation of blood and atmospheric air.

Another fact is also worthy of observation here—the *rapidity* of this circulation. Nature, or rather the God of nature does nothing in vain. There is still another thought no less worthy of our notice, viz. the *uniformity* of this circulation. This uniformity is so great that it is a measure of health, and the absence of it an indication of disease.

Certain changes are produced upon the blood by its passage through the lungs. These changes have been traced with great accuracy by Priestly, Fourcroy and, among other philosophers,

*Trans. Jour. Vol. 1, p. 227.

by Davy. These changes so far as we are acquainted with them are the following.

1. It acquires a florid red colour and loses a portion of its carbon. 2. Its capacity for caloric, is increased, and therefore, agreeably to a well known chemical principle, it becomes more thin and fluid.

It has long been known that the blood that flows in the veins is of a dark reddish purple colour, whereas the arterial blood is of a florid scarlet colour. To this subject Lavoisier paid great attention. The result of his investigations was, that the colour of the blood is changed by the combination of oxygen. His theory on this subject has been denominated the *oxygenation* of the blood. This theory it is known has been laid aside. Has it not been laid aside too hastily? I believe it has: and for this I have two reasons. That venous blood, whether during the circulation or immediately after it has been drawn from the veins, is changed to a florid scarlet colour, by coming in contact with oxygen gas, is too well established by experiment to be doubted. Now can any fluid be changed in its colour unless something be added to it, or subtracted from it. I know the present theory is that the change of colour is owing to the abstraction of carbon. If this were the *only* cause, would the change of colour always be the same as observed in the living animal? I apprehend not; because the quantity of carbonic acid emitted at each expiration, varies at different periods of the same day, and probably in different individuals: It appears at its maximum during digestion, and at its minimum in the morning, when the stomach is empty, and when no chyle is flowing into the blood. Now is it agreeable to philosophy, to say that this uniformity of effect can be produced by a cause which operates with so little uniformity?

But I have another reason for not throwing away entirely the theory of the oxygenation of the blood. If, as I have endeavoured to show in my former paper and as I have no doubt will ultimately prove to be true, a portion of oxygen, equal to at least two per cent. disappears at every expiration, we may ask what becomes of it, if it is not employed in oxygenating the blood. It will not be said that two per cent. is by far too small a quantity of

oxygen to produce any effect. This objection will vanish by making a very small calculation. If we suppose twenty-five cubic inches of atmospheric air to be taken in at every inspiration, (which I am convinced is below the truth, with a man of ordinary size,) this multiplied by the ordinary number of inspirations, viz. twenty in a minute, will give five hundred cubic inches of atmospheric air passing through the lungs every minute. This five hundred divided by five (and more than one fifth of the atmosphere is oxygen,) will give one hundred cubic inches of oxygen passing through the lungs of a man of ordinary size every minute, two cubic inches of which goes into the circulation. Now inasmuch as blood newly drawn from a vein, and brought into contact with oxygen gas, uniformly changes its colour, and, if the experiment be performed over mercury, the mercury perceptibly rises in the receiver, is it not fair to draw the following conclusions? that a portion of the oxygen has combined with the blood, and has aided in the change of colour. If this reasoning be correct the old abandoned theory of Lavoisier ought to be revived. *The blood is oxygenated in the act of respiration.*

But the oxygenation of the blood is not the only change that is produced upon this fluid by respiration. The blood is also *decarbonized.* The change of the colour of the blood is partly owing to the action of the air, which takes place through the thin coats of the circulating vessels; and the end thus attained, is the removal of a portion of carbon from the venous blood. It can scarcely be doubted that the presence of carbon obscures the colouring matter of the blood, and consequently the venous blood is of a black or dark colour. That this blood is decarbonized by coming into proximity with atmospheric air, we think can be doubted by no person, except under the influence of à love of theory in the face of fact. When on the subject of the black colour of the venous blood, the chemist has been asked if carbon is *black.* We answer no; *pure* carbon is not black; but impure carbon is always black, or approaching to black. From this remark I do not now recollect a single exception. These two chemical differences, therefore, between venous and arterial blood, are we think well established; viz. that arterial blood is oxygenized, and

the oxygen imbibed, in part, affects its colour. The venous blood is decarbonized, and by this process in part, it is converted into arterial blood. The blood is by this twofold process reconverted, and is fitted for the renovation of parts of the body, for the formation of secretions, and for the sustenance of life, by its action on the cerebral system. It is worthy of remark, that although the heart does not refuse to circulate venous blood, paralysis and stupor never fail to be produced, when blood not aerated, passes into the brain.

I have only farther to remark upon this part of the subject; that when oxygen is changed into carbonic acid, it does not materially change its bulk; and that the blood from the best experiments, in a man of ordinary size, must emit carbon in or through the lungs, to the extent of three fourths of a pound in one day. Now we lay it down as a fact which cannot be controverted, that no compound substance in a fluid state, can be exposed to the constant action of the atmospheric air without undergoing a greater or less change by that exposure. Water itself, between the ultimate elements of which there is the most perfect balance, and consequently the most intimate union, loses some of its properties by being excluded from the action of the atmosphere, and regains them by its readmission. It would therefore be miraculous indeed, if the blood did not undergo constant changes by its constant exposure to so great a quantity of atmospheric air, as five hundred cubic inches in a minute. The fact is, it is impossible for these two fluids, the blood and atmospheric air, to come in contact with each other, or if not into absolute contact, into such a state of proximity as they do, without mutually decomposing each other, when we take into consideration their constituents. Now this decomposition is constantly going on by the agency of living organs, the lungs, upon dead matter, the atmosphere.

Perhaps the atmosphere is vital too; and then the chemical actions of which we have been speaking, are nothing more than the agency of two vital principles upon each other, and of course the whole of them are without the legitimate field of chemistry, according to some philosophers: and after all that has been written about the vitality of the blood, I would as soon suppose that the

air was vital as that the blood was. Whether the blood be vital or no, or whether it be or be not partially decomposed by the action of the atmosphere, we know that it is a very compound body and subject to perpetual decomposition by some means.

Blood usually consists, according to Dr. Ure, of about three parts serum to one of cruor: and according to Berzelius, 1000 parts of the serum of bullock's blood consists of 905 water, 79.99 albumen, 6.175 carbonate of soda, and extractive matter, 2.565 muriate of potash and soda and animal matter, and 4.75 loss. One thousand parts of the serum of human blood consists of 905 water, 80 albumen, 6 muriate of potash and soda, 4 carbonate of soda with animal matter, and 4.1 of soda and phosphate of soda, with animal matter. But suppose it should be said that none of these substances are found in the blood in a *free* or *formal* state. On this supposition I should like to know how we are to account for the two following experiments; viz. that the serum of blood changes the syrup of violets to a green, if blood does not contain *free* soda or some alkali. If there be not free carbonic acid in blood, how can we account for the fact that newly drawn blood under an exhausted receiver, gives it out in considerable quantities. If blood be thus compounded, can we for a moment resist the belief that the presence of the atmosphere must necessarily decompose it.

Before we progress farther into this curious and certainly chemical investigation we ought carefully to note two things.

A great many experiments have been made by different chemists to ascertain which of the two fluids venous or arterial blood, has the greatest capacity for caloric. Dr. Crawford makes the capacity of arterial blood for caloric to exceed that of venous blood as 1.0300 does 0.8928; Mr. Davy, who, I believe, makes it less than any other philosopher whose works I have examined makes it as .913 to .903. All agree that there is a considerable difference.

A second fact equally well established by experiment, is, that the specific capacity of oxygen and carbonic acid gas for caloric, is also considerably different; oxygen having a greater capacity for caloric than carbonic acid. According to Crawford, the capa-

city of oxygen for caloric, is to the capacity of carbonic acid for caloric as 4.794 to 1.333; and according to Dalton as 1.333 to 0.2361. That is if the capacity of a portion of water for caloric be represented by 1000, the capacity of a similar portion of oxygen for the same, is 4.794, and that of carbonic acid 1.333 according to Crawford.

But there is another circumstance which would lead us to conclude that arterial blood has a greater capacity for caloric: It is I believe universally admitted that arterial blood is thinner and more fluid than venous blood. It is a law of nature, from which I do not now recollect any exception, that all fluids under the influence of an increased capacity for caloric are thinner or more fluid. I am aware that this increased fluidity is said to be owing to an increased *vitality*. Now if vitality be the cause of fluidity in one animal fluid, we cannot see why it must not be the cause of fluidity in other animal fluids. In other words, if fluidity be the effect of vitality in one instance, it would be but reasonable to suppose that it would be the effect of vitality in every other instance; and consequently that fluidity in any animal fluid is a measure of its vitality; and therefore the urine or the milk, or any other secretion is more vital than the blood. This will not be contended for by any one; nor ought it ever to be contended for that the fluidity of the arterial blood is owing to its *greater vitality*. I imagine it is merely owing to its greater capacity for caloric.

We think that the above facts and indications have been abundantly established by the experiments of the ablest philosophers; nor ought they to be called in question, but by a similar set of equally well conducted experiments and inductions. From them we obtain the two following important uses of respiration.

1. The change of the chyle into blood. Indeed the blood is a fluid which is constantly running through a suit of changes; and it is preserved in a similar state only by the constant influx of new materials, which are constantly converted into blood. It appears from the most accurate experiments hitherto made, that neither chyle nor lymph contains fibrin. This fibrin is em-

ployed to supply the waste of the muscles, the most active part of the body, and therefore in all probability requiring the most frequent supply. The quantity of fibrin in the blood, must then constantly be diminishing, and therefore new fibrin must constantly be formed. But the only substances out of which it can be formed, are the lymph and chyle, neither of which contain it. There must therefore be a continual decomposition of the chyle and the lymph going on in the blood vessels, and a continual formation of fibrin. Other substances may be formed, but we are certain this *must* be formed there, for it did not exist previously. Now one great end of respiration must undoubtedly be, to assist this decomposition of chyle, and complete the formation of blood.

In what manner chyle or a part of it is converted into fibrin, is perhaps impossible to say: we are not sufficiently well acqnainted with the subject to explain the process; but we can see at least, that carbon must be extracted from that part of the chyle, which is to be formed into fibrin. Hence, as the process of blood-making advances, there must be a greater and greater redundancy of carbon in the blood. Unless this redundancy were removed, the process could not go on, and probably the whole would run into putrefaction. We conclude then that one great end of respiration is to abstract the carbon, by forming carbonic acid.

2. But the abstraction of carbon is not the only advantage gained by respiration. The temperature of all animals, depends in a measure upon it.

It has long been known that those animals which do not breathe, have a temperature but little superior to the medium in which they live. This is the case with fishes and many insects. Man on the contrary and quadrupeds which breathe, have a temperature considerably higher than the atmosphere: that of man is 98°, and in all latitudes the temperature of the human body is the same. Birds who breathe in proportion to their size a still greater quantity of air, have a temperature equal to 103° or 104°. It has been proved that the temperature of all animals is in proportion to the quantity of air which they breathe in a given time.

These facts seem sufficient to prove that the heat of animals

depends at least in some measure upon respiration. But it was not till Dr. Black's theory of latent heat became known to the world, that an exposition of the cause of the temperature of breathing animals was attempted.

According to him, part of the latent heat inspired becomes sensible; and of course the temperature of the lungs, and the blood that passes through them, must be raised; and this blood thus heated, communicates its heat to the body. This opinion was ingenious, but was liable to an insuperable objection; for if it were true, the temperature of the blood ought to be greatest in the lungs, and diminish gradually, as the distance from the lungs increases; which is not true, to any great extent. The theory was consequently abandoned even by Dr. Black himself.

Dr. Crawford who considered all the changes operated by respiration, as taking place in the lungs, accounted for the origin of animal heat almost precisely in the same way with Dr. Black. According to him the oxygen gas of the atmosphere, combines in the lungs with the carbon emitted by the blood. During this combination, the oxygen gives out a great quantity of caloric, with which it had been combined; and this caloric is not only sufficient to support the temperature of the body, but also to carry off the newly formed water in the state of vapour. According to this philosopher then, the whole of the caloric which supports the temperature of the body is evolved in the lungs. This theory accordingly was liable to the same objection with Dr. Black's; but Dr. Crawford obviated it in the following way. He found that the specific capacity of arterial blood for caloric, was 1.0300, while that of venous blood was 0.8928. Hence he concluded that the instant venous blood is changed into arterial blood, its capacity for caloric increases; consequently it requires an additional quantity of caloric to preserve its temperature as high as it had been while it was venous blood. This addition is so great, that the whole new caloric evolved is employed; and therefore the temperature of the lungs must necessarily remain the same as that of the rest of the body. During circulation arterial blood is gradually converted into venous blood, consequently its specific caloric diminishes, and it must give out heat. This is the rea-

son that the temperature of the extreme parts of the body does not diminish.* If we add to the above remark a fact, to a greater or less extent admitted by all philosophers, that the capacity of carbonic acid gas for caloric is considerably less than that of oxygen gas, and reflect that the portion of carbonic acid emitted in respiration is nearly equal to the quantity of oxygen consumed, we have a copious source of animal heat; for all the extra portion of caloric which was necessary to preserve the oxygen in a gaseous state, above what was necessary to preserve the carbon in that state, must go into the general circulation.

Let any philosopher put together the following facts and candidly admit the inductions.

1. The astonishing rapidity of the circulation, even if we assume that calculation which is the lowest. Why this perpetual rushing of the blood "to kiss" the atmosphere so often in an hour?

2. Why expose twenty cubic inches of the atmospheric air to the blood, sixteen or twenty times renewed every minute? Shall I be told "to vitalize it?" Very well: and in what does this vitalization consist, if not in imparting to the blood a small portion of that gas without which the lamp of life would be extinguished, and subducting from it another gas, the abundance of which induces death? If any thing else be meant by vitalizing the blood, I should like to know what is meant. I am afraid the terms vitality and vitalization, have a strong resemblance to Aristotle's occult qualities.

3. A third and to me a beautiful coincidence of causes presents itself when we reflect that at the moment when the inspired oxygen of the atmosphere necessarily parts with a portion of its caloric when converted into carbonic acid, the venous blood has its capacity for caloric increased, by being converted into arterial blood, and the system is thus supplied with caloric, regularly emitted as the arterial blood changes into venous blood.

I do not know that I should contend for respiration, or the oxygenation and decarbonization of the blood, as being the only source of animal heat, although it seems to me a sufficient source.

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*In order to do the above named philosophers justice, we have nearly quoted their own words.

It is known to those conversant with chemico-physiological books, that the following sentiment dropped from the pen of Dr. Cooper (now of South Carolina) a few years ago. "I see no material difficulty in accounting for the production of animal heat from the doctrine of latent heat. The fluids of the body are incessantly employed to renew the solids; whenever a fluid is converted into a solid, heat or caloric is evolved, this takes place every moment very gradually in every part of the animal body."

It is said a gentleman of great philosophical pretensions, caused Dr. Cooper to abandon his ground, by suggesting, that the absorbents are constantly employed, in converting the old and worn out solids into fluid and carrying them off; and that consequently as much caloric is employed in reconverting the solids into fluids, as had been received by the system, when the fluids which had been employed in nutrition, had been converted into solids.

This objection to Dr. Cooper's hypothesis is certainly plausible, but not sound. Is it certain that this old worn out rubbish of the system, when it passes off in some of the gaseous or liquid forms, has the same *specific capacity* for caloric, which the comparatively living materials have, which present themselves to us in the forms of chyme and chyle, and fibrin, out of which, nature is about to repair her waste. This is, as far as I know, a new subject, and one on which no direct experiments have been made. But we would venture to pronounce that all the analogies and probabilities are in favour of the opinion, that the *calorific capacities* of the fluids, as we receive them into our system, far, very far exceeds the calorific capacities of those dead matters, which are momently carried off from the system. We have proof positive, that oxygen which we are constantly receiving for the sustainment of life, has a much greater *capacity* for caloric than carbonic acid, which, as we have seen, is constantly casting off. I therefore think Dr. Cooper's ground perfectly tenable, and if he has abandoned it, we should like to see him resume it. Thus we have a second source of animal heat. But we have no doubt respiration is the main source, and the constant supply of that fluid to the body is one of the chief objects of respiration. Says Dr.

Thompson, "the fact that all animals which respire regularly, are hot-blooded, while amphibious animals and fishes are cold-blooded, seems to me to establish a connexion between respiration and animal heat."

Nature is not more beautiful than she is simple; all her indications may be relied upon. Every where we see the wisdom, power and œconomy of the great architect of the universe.

"When air's pure essence joins the vital flood,
And from carbonic acid frees the blood,
Contractile tubes the transient heat dispart,
And lead the soft combustion round the heart."

ART. V.—*An Essay on Autumnal Diseases.* By JOHN ESTEN COOKE, M. D. Professor of the Theory and Practice of Medicine in Transylvania University.

In a former number of the Transylvania Journal of Medicine &c. I have endeavoured to give an outline of an attempt, since published,* to investigate the connexion between the remote causes and the symptoms of fever and of some other diseases, by inquiring into the effects of those causes on the body; next into the effects of those effects, or new causes, and so on descending to the ultimate effects, the symptoms in question. In the present paper it is proposed to take a view of the origin of that cause which produces the autumnal diseases, of its effects on the system, and of the best mode of obviating them.

Most of the remote causes of fever do not produce epidemic disease. Excessive fatigue, violent emotions of the mind, excessive stimulants, &c. do not operate upon such numbers as are affected during the prevalence of epidemics, nor are they confined in their operation to particular seasons of the year. Famine is capable of producing epidemic disease, but it is comparatively a rare occurrence; whereas epidemics are annual in many parts of

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*A Treatise of Pathology and Therapeutics, by John E. Cooke, M. D. &c.

the earth, so as to have given rise to the expression, *the sickly season.* Cold sometimes produces epidemic disease, but rarely except in conjunction with the cause of autumnal fever, as will hereafter appear. It is in hot weather, as the history of epidemic diseases shows, that almost all of them arise.

The inquiry into the cause of these hot-weather epidemics, and the interesting questions connected with the subject, are of incalculable importance; inasmuch as this agent exerts a greater influence over the health of the human race than all the other causes of disease put together. This assertion will not be considered extravagant if, (as is believed to be completely established in the treatise above alluded to), this be also the cause of typhus fever, of plague, and, in conjunction with cold, of the winter epidemics which occasionally prevail in every part of the temperate climates.

In attempting to investigate the origin of these diseases, the first circumstance that strikes the attention is, that they are particularly severe and frequent in hot climates. As we advance northward we find them less common and less violent; and the colder countries rarely suffer from them.

In temperate climates, the hot months are the time of special sickness, the season in which epidemics arise. When raging with their utmost violence, the occurrence of frost or even of very cool weather, instantly checks their progress and soon puts an end to them. In tropical countries no season is exempt from their occasional appearance, and in some parts they prevail throughout the year. Heat therefore is essential to the prevalence of these diseases.

Heat alone however, in the degree usual in the hottest climates, is not sufficient to produce epidemics. The dry season on the West coast of Africa is comparatively healthy. The inhabitants of the great deserts of that continent are not affected by these epidemics. The diseases of Egypt never spread into the neighbouring deserts occupied by the Bedouin Arabs. The West-India islands vary exceedingly with regard to health. Barbadoes is a healthy island; Jamaica and Hayti are very sickly. The latter are five degrees farther north than the former. Our hot-

test seasons are, in many situations, the most healthy; and during the prevalence of an epidemic in hot weather, many places escape at a very short distance from those which suffer severely.

These partial effects show the operation of a partial cause, while heat is general in its action. Heat alone is therefore not the cause of the epidemics of hot weather.

Moisture is also necessary. The hot countries within the tropics, which are in general healthy during the hot and dry season, become sickly soon after the rains commence, and continue so throughout the wet season, and afterwards until the abundant moisture is evaporated. As soon as this is effected, the health of the country is restored, except in those places which continue wet throughout the year. The rainy season and the sickly season are synonymous terms.

The very same may be said of the extensive country of the Southern and Western states of America. Wet summers are sickly, and dry summers are healthy except in the neighbourhood of marshes, ponds, or rivers. This was strikingly exemplified in the occurrences of the years 1822 and 1823. In the former, in most parts of the country, the summer was the dryest perhaps ever known; the latter one of the wettest.

In the excessively dry summer of 1822, the valley of the Shenandoah in Virginia was generally healthy. The few places which suffered are near marshy grounds, or rivers which in that arid season were almost dried up, leaving extensive flats covered with an abundance of the vegetables which grow in water, exposed to the action of the sun. The highlands below the Blue Ridge were likewise healthy, and the parts that suffered were on the marshy borders of the rivers. In Pennsylvania, about Harrisburg, the middle of July was wet and sickly; afterwards it became very dry, and the epidemic declined.* In Ohio the weather was so dry that "the Ohio river was lower than ever known since the settlement of the country. The water was in most places nearly stagnant, resembling a long lake more than a river, and covered with a mucous scum or froth." The autumnal diseases did not

*Medical Recorder, No. 21, p. 139.

prevail in this year, but were "wholly confined to the neighbourhood of streams;" and it was even observed "that those settlements located where the shores of the river were bold and not lined with a wide beach, were uniformly healthy, and vice versa."*

On the other hand, in the year 1823 the rains were excessive in Pennsylvania, Maryland, Virginia, Ohio, Mississippi, and Alabama, and the autumnal epidemic was very severe in all these states. Even in the year 1822 a similar contrast was exhibited in different parts of the country. While Virginia, Pennsylvania and Ohio were (as already stated) dry and healthy, Kentucky and Mississippi were excessively wet, and very sickly. The summer was hot, the rains commenced early, and the epidemic made its appearance sooner than common, and was very severe. The same contrast is observable in different years in every neighbourhood. Thus, at Natchez the year 1816 was very dry and healthy, 1817 wet and sickly, 1818 dry and healthy, and 1819 wetter and more sickly than 1817.

It is evident therefore that in dry seasons health is general, and in wet seasons sickness is general; that the sickly spots *in dry* times are near streams, ponds, or marshes; and that when one part of the country is dry and another wet in the same season, the dry part is healthy, except about streams, ponds, and marshes; and the wet part sickly.

It follows from the preceding statements that the concurrence of heat and moisture is necessary to the production of epidemic disease. But though necessary, they are not sufficient to produce them. Vessels at sea, or at a small distance from land, in the hottest climates, even in the rainy season, continue healthy if they be kept clean. Lind from experience of this, advises those who are able, to retreat to floating habitations during the sickly season. Instances have frequently occurred of a superabundance of moisture in hot weather being favourable to health. Pringle tells us that the neighbourhood of the towns of Brabant, in 1748, was inundated as a protection from the enemy, that the air "sensibly became more noxious upon letting off part of the water in

*Phil. Journal &c. No. 17, p. 106. 107.

the beginning of summer, after the preliminary articles of peace were signed;" and that the States of Holland being made sensible of this by the sickness which raged at Breda, gave orders to let in the water again, and to keep it up until winter. In the autumnal season of 1798 in Boston, the inhabitants living near a mill-pond in the town were sickly. This pond was often drained so as to leave the bottom exposed to the action of the sun. The water was ordered to be retained constantly in the pond, and this being done, the fever ceased in that quarter. Excessive rains have often produced the same effect. "Dr. Dalzilles, in his treatise upon the diseases of the negroes in the West-Indies, informs us that the rainy season is the most healthy at Cayenne, owing to the neighbouring morasses being *deeply* overflowed." In the island of Trinidad, the centre of which is a vast morass, an abundance of rain is salutary. Dr. Ferguson calls them preserving rains, because a deficiency is sure to be followed by sickness. He also says, "In the island of St. Lucia, the most unwholesome town of Castries, at the bottom of the Carenage, which is altogether embosomed in a deep mangrove fen, became perfectly healthy under the periodical rains." He further states that a year of uncommon drought is infallibly a year of pestilence to the greater part of the West-India colonies. Therefore a rainy year is healthy in the most of these islands. Lind makes the same statement of the island of Sardinia.

Heat and moisture are therefore not sufficient to produce epidemic diseases. Something more is necessary; and the additional requisite is easily discovered by attention to the situation and circumstances of the places most liable to these diseases.

In the tropical countries, cities and stations which have been the graves of unnumbered thousands, are situated near marshes, or at the mouths, or on the banks of rivers, in flat countries which, in the rainy season, are inundated. In more temperate climates, similar spots are the seat of similar diseases in the summer and fall; as in Holland, and many parts of Italy; and of our own country, as we may observe by looking around us in our own immediate neighbourhood. The marshes, the marshy borders of rivers,

the artificial morasses produced by building mill-dams, are spots noted for disease.

On the other hand, places situated at a distance from marshes or low grounds are comparatively free from disease. It is unnecessary to cite cases in support of this; the observation of every man will afford him evidence of its truth.

Places formerly healthy have often been rendered unhealthy by an artificial morass, as is witnessed in every neighbourhood where a mill-dam is built; and places in the neighbourhood of ponds or marshes, formerly unhealthy, have been rendered healthy by draining off the water. A multitude of examples of this might be cited.

It has been objected to this doctrine that some marshy situations are generally healthy, and yet sometimes suffer; while others are generally sickly, yet sometimes escape. This objection is easily obviated.

Marshy situations, generally healthy, have become sickly during a very dry season. A marsh covered deep with water, or a mill-pond well filled and exposing no marshy surface, may have produced no injury for years. A very dry season, by evaporating the water, and exposing the bottom to the action of the sun, renders the neighbourhood sickly. The effect of such exposure may be estimated by what has been said of the occurrence at Breda in 1748, and at Boston in 1798. Senac mentions an instance in which the bottom of a pond was brought within the influence of the heat of the sun in a different manner with the same result. "Near the walls of a large city stood a very extensive and deep pond of water, which for forty years had served as a receptacle of all the filth from the houses and streets. As long as these putrid matters remained covered with water, they were productive of no mischief. But when they had so far accumulated as to rise above the surface of the water, a most malignant fever spread through the tract of country adjoining the city."*

The same cause, dry weather, in different circumstances produces effects precisely opposite. A marshy spot, which has here-

*Senac on Fevers, translated by Charles Caldwell, M. D. &c. p. 20.

tofore rendered a neighbourhood sickly, may be dried up, and the consequence is health, as certainly as if it were rendered dry by draining off the water.

Very wet weather sometimes produces the same beneficial effects on marshy places ordinarily sickly, by covering them from the action of the sun. Of this several instances have already been stated, from Dr. Dalzilles and Dr. Ferguson.

Thus we find that excessive heat, by drying up the moisture in a marshy tract of country, will make it healthy; or by making a marsh of a pond formerly well filled, will produce unusual sickness. On the contrary, that excessive rain will fill a country hitherto dry and healthy, with marshy spots, and produce fatal disease; or will cover from the action of the sun extensive marshes, and prevent the evil which would otherwise have followed. The *marshy state* of the soil, therefore, is necessary to the production of disease, and all the facts confirm the doctrine that marshes are the special seat of epidemic fevers.

The following facts shed light on the connexion of that agent which is the cause of epidemic diseases, with this state of the soil.

"Lancisius relates that thirty gentlemen and ladies of the first rank in Rome, having made an excursion upon a party of pleasure towards the mouth of the Tiber, the wind suddenly shifted, and blew from the south *over the putrid marshes;* when twenty-nine were immediately seized with a tertian fever, one only escaping."*

Similar effects on a change of the wind blowing over marshy grounds, have been observed in many parts of this country; in Boston, New-York, Philadelphia, Baltimore, &c. The following striking instance occurred near Galliopolis on the Ohio river in 1796. Major Prior of the army, witnessed the rise and progress of the disease, and on a visit to Baltimore in the following year, made for Dr. Potter, Professor of the Theory and Practice of Physic in the University of Maryland, a statement in writing from which the following is taken.—"As the garrison was severely af-

*Lind on Hot Climates, p. 21.

flicted by this fever, I could but take great interest in it. The fever was, I think, justly charged to a large pond near the cantonment. An attempt had been made, two or three years before, to fill it up by felling a number of large trees that grew on and near its margin, and by covering the wood thus fallen with earth. This intention had not been fulfilled. In August the weather was extremely hot, and uncommonly dry; the water had evaporated considerably, leaving a great quantity of muddy water, with a thick slimy mixture of putrefying vegetables, which emitted a stench almost intolerable. The inhabitants of the village, principally French, and very poor as well as filthy in their mode of living, began to suffer first, and died so rapidly that a general consternation seized the whole settlement. The garrison continued healthy for some days, and we began to console ourselves with the hope that we should escape altogether; we were, however, soon undeceived, and the reason of our exemption heretofore was soon discovered. The wind had blown the air arising from the pond *from the camp;* but as soon as it had shifted to the reverse point, the soldiers began to sicken: in five days half the garrison was on the sick list; and in ten half of them were dead."*

The inference from these facts, that a vapour or gas, produced in marshy places, is the cause of the epidemic fevers of hot weather, is irresistible. Nothing but a vapour or gas can take the direction of the wind blowing over these places, and produce its effects in every quarter to which it is carried.

Marshes during the heat of summer and autumn, when these diseases appear, abound in vegetable matter undergoing the process of decomposition, whence proceeds an abundance of gas. All the circumstances favouring the prevalence of epidemics, are such as peculiarly favour the decomposition of vegetable matter. Thus heat and moisture are both necessary; but such a degree of heat as by drying up a marsh, puts an end to the decomposition of vegetable matter therein, puts an end also to the prevailing epidemic; or, such an abundance of moisture as, by covering the vegetable matter, and protecting it from the action of the sun,

*Potter's Memoir on Contagion; also Med. Recorder, No. 4, p. 527.

checks or puts an end to decomposition, produces the same effect. Further, as long as there remains any moisture in a marshy place, the greater the heat and therefore the more rapid the decomposition, the more violent the epidemic; while frost, which puts an end to decomposition of vegetable matter, puts an end to the epidemic.

There is therefore very strong reason to believe that the gas driven by the wind from marshy places, which is the cause of epidemic fevers, is the product of the decomposition of vegetable matter.

This is corroborated by the occurrence of such diseases when vegetables in bulk, as potatoes, &c. are suffered to putrefy. The holds of vessels, particularly ships of war, contain large quantities of vegetable matter, such as peas, oatmeal, cocoa, flour, &c. in casks often not strong enough to prevent their contents from escaping. They also contain wood for fuel sometimes in great quantity, and quite green. Many instances are related of the air of the holds of ships becoming so impure that candles would scarcely burn in them.* The ship Regalia sailed from Guernsey for Africa in November 1814 and arrived in February 1815, full of troops in perfect health. In the latter end of June she took in a supply of wood for a voyage to the West-Indies, where she was about to convey a number of black troops. The wood was cut down and carried on board the same day; and the quantity was such that after she had been in the West-Indies several weeks she was found still to have enough for a voyage to Europe. She sailed from Africa on the 18th July, and arrived in the West-Indies on the 24th August. The crew began to sicken in a fortnight after the wood was laid in. One died before sailing; two the day after: all but two were attacked on the voyage, and five out of twenty-one died. An officer and his wife, and the captain and his wife also died. Among the troops there was considerable mortality on the passage; and after their arrival in the West-Indies, between the 24th of August and the 24th of October, one hundred and eleven of them were sent to the hospital with the flux, of whom fifty-three died.

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*Bancroft's Sequel, p. 232–3.

At English-harbour, Antigua, this vessel was fumigated, and after three days' detention sailed to Barbadoes. During this short voyage three newly entered hands sickened; one died, and two were sent to the hospital. On her arrival three more sickened, one of whom had lately entered, and one died. The hold was now ordered to be cleaned out. Every thing was taken out of it, and it was exposed to the concentrated heat of stoves, the hatchways being closed. About the time the cleansing commenced, of three men newly shipped, two sickened, of whom one died; and the cook, upwards of fifty years of age, died.

After having undergone a thorough cleansing, she sailed for Guadaloupe with a crew of French prisoners and their families out of the jails, one of whom had the yellow fever, but no fever prevailed on board.

This vessel, before this great quantity of green wood was shipped, was healthy. A fortnight after, sickness commenced, affected almost every body on board, killed about one third, and attacked almost every one who was shipped in place of those who had perished. After a thorough cleansing, she sailed with a crowd of prisoners taken out of jail, and no fever arose among them.

These facts and many similar to them, abounding in medical works, confirm the inference, that a gaseous fluid, the product of the decomposition of vegetable matter abounding in marshes and other places, is the cause of epidemic diseases.

This gas is dense or it would arise from the earth and not be driven along its surface by the wind, as in the fever at Gallipolis above stated. Numerous facts shew that it is dense. Those persons who inhabit the lower stories of houses are much more liable to an attack of fever, than those who inhabit the upper ones. Low places, as dry ravines, dry ditches of forts, &c. are very dangerous places to occupy, and centinels who are posted in them are very liable to be attacked.

The evidence therefore is positive, that a dense gas proceeding from marshy places, or driven from them by the wind, is the cause of the epidemics of hot weather; and there is the strongest reason to believe that it is the product of the decomposition of vegetable matter.

It would not be proper in treating this subject, to pass over in silence the objections made to the doctrine here advocated, in a paper read before the Royal Society of Edinburgh in 1820 by WILLIAM FERGUSON, M. D. F. R. S. a gentleman of talents, great experience and extensive opportunities of observation. These circumstances are well calculated to give weight to what he advances, and accordingly his objections have been well received, which renders it more necessary to show that they are not well founded. Error in principle cannot fail to lead to error in practice.*

Dr. Ferguson asserts "that putrefaction, under any sensible or discoverable form, is not essential to the production of pestiferous miasmata." In support of the opinion "that the marsh poison cannot emanate from vegetable putrefaction," he asserts "that it is found most virulent and abundant on the dryest surfaces; often where vegetation never existed, nor could exist for the torrents, such as the deep and steep ravines of a dried water-course; and that it is never found in savannahs or plains, that have been flooded in the rainy season, till their surface has been thoroughly exsiccated; vegetation burnt up; and its putrefaction rendered as impossible as the putrefaction of an Egyptian mummy."

In support of these assertions he brings forward several statements, which show that the cause in question is found in a number of places such as he describes, viz. very dry surfaces, as hill-sides, and plains which have become dry after having been flooded. These statements are admitted to be true; and they prove that the pestiferous gas is found in those places; but it does by no means follow that it is never found in them until their surface has become "exsiccated." There is a profusion of evidence to the contrary. Lind speaking of Senegal says, "This, as most tropical countries, has properly speaking only two seasons, the wet and the dry; the former is only of about four months continuance, and is the season of sickness," &c. "*Soon after the rainy season began*, a low malignant fever constantly spread itself

*This paper was republished in the 13th No. of the Phil. Journal, with marked encomiums by a distinguished physician.

among the Europeans." "The most mortal epidemic however is that low malignant fever of the remitting kind, which rages only in the rainy season."* Nor is this at all variant from our own experience. Not to multiply instances, it is fresh in our recollection that in the extraordinarily sickly summer and fall of 1823, the plains of this country were so far from being exsiccated, that the roads were miry throughout the autumnal season from continual rains. This is more than sufficient to show the incorrectness of the assertions, that the malaria "is found most virulent and abundant on the dryest surfaces," and "is never found in savannahs or plains that have been flooded in the rainy season, till their surface has been thoroughly exsiccated" &c.

It is evident then that all that is established, and that is not denied, is that the malaria was found on those particular spots mentioned; and there is no difficulty in showing that in every case vegetable matter in a state of decomposition existed on the spot, or near enough to produce the effects observed.

The cases in which epidemic disease appeared on plains that had been flooded and had become dry, shall first be considered.

The English troops in the south of Holland suffered very much in the hot and dry summer and autumn of 1794. They were encamped on "a level plain of sand, with a perfectly dry surface, where no vegetation existed or could exist but stunted heath plants: on digging, it was universally found to be percolated with water to within a few inches of the surface" &c.

Holland abounds in marshes, or rather it is a great marsh. Pringle speaking of two villages, one ten feet, the other fourteen above the subterranean water, mentions this as an extraordinary height in that country† In such a country, in so hot a summer, decomposition of vegetable matter must have taken place to a very great extent; and the mere fact that the army was encamped on a plain of sand, with no vegetable but heath plants stunted by the drought of that year, is no argument against its sufferings being produced by a gas arising during the process of decomposi-

*Lind on Hot Climates, p. 32, 41, 42, &c.

†Pringle on Dis. of the Army, p. 63.

tion, in a country where there is not a hill to obstruct the passage of miasmata, and where marshes to produce them so abound, that they must be carried by every wind upon them. In 1810 another English army suffered in the same way in the same country.

An English army was marching, in 1809, through a dry country of considerable elevation, on the confines of Portugal. May had been very wet, and the weather had been so hot for several weeks as to dry up the mountain streams, and had left stagnant pools of water among the rocks. In the ravines that had lately been water-courses, several regiments took up their bivouac for the sake of being near the stagnant pools, the water of which was "perfectly pure"; and several of the men were immediately after seized with remittent fever, and part of that portion of the troops were exclusively affected for some time. "The army advanced to Talavera through a very dry country, and in the hottest weather fought that celebrated battle which was followed by a retreat into the plains of Estremadura, along the course of the Guadiana river, at a time when the country was so arid and dry, for want of rain, that the Guadiana itself, and all the smaller streams, had, in fact, *ceased to be streams and were no more than lines of detached pools* in the courses that had formerly been rivers; and there they suffered from remittent fevers of such destructive malignity, that the enemy and all Europe believed that the British host was extirpated."

This statement certainly operates against Dr. Ferguson's doctrine. May was very wet, and the weather in the following months was very hot and the country had become very dry. During this time the army marched through a part of Portugal and Spain, and, except a small part of it which encamped in the "half-dried ravine," which was the bed of a stream, continued free from fever, until they were forced to retreat into the plains of Estremadura, along the course of the Guadiana, when that river and its branches had become mere lines of detached pools; and "*there* they suffered from remittent fevers of such destructive malignity" &c. This is precisely what occurs with us. When for want of rain the country is burnt up, as happened in many parts

of this continent in 1822, it is generally healthy. Few cases of fever occur except near ponds, marshes, and the streams which have become *mere lines of pools;* and it is observed that the cases in such situations are very severe. If "one only condition be indispensable to the production of the marsh poison, on all surfaces capable of absorption," viz. *paucity of water* where it has previously and recently *abounded;* if it be found only in plains that have been flooded in the rainy season, after their surface has been thoroughly exsiccated; why was the English army healthy on their march until they arrived on the banks of the Guadiana, at that time a line of pools? and why was that part of the army alone affected during their march, which encamped in the bed of a stream which had also become a line of pools? why was that part affected which encamped where the surface had not yet become exsiccated, and why did those escape who remained on that which had? why, in short, is sickness confined, in dry years, to the wet places near rivers &c.? and why does it extend to every part of the country in wet years amidst continual rains which never allow the surface to dry?

Several other places in Spain are mentioned as being very sickly, all of them on the banks of rivers. In that fertile country the spring of the year is very wet, the summer very hot. In such circumstances an immense amount of vegetable matter must be decomposed; whenever and wherever it is going on the people are sickly, and that it is to be attributed to a gas produced during the process of decomposition is evident from the remarkable occurrence at Galliopolis before stated, and from a multitude of others similar to it.

Dr. Ferguson states that the leeward shore of Guadaloupe for a course of nearly thirty miles, though the soil is remarkably open, dry and pure, and without marsh in the most dangerous places, is inconceivably pestiferous throughout the whole tract, and in no place more so than the sandy beach near high water mark.

The name Guadaloupe is given to two islands having a very narrow channel of sea water between them. The leeward island is called Basse-terre, (or low-land,) from being very low and marshy; the other called Grand-terre, has also large marshes, as

may be gathered from Dr. Ferguson's account of the situation of Point-au-Pitre, situated on the leeward shore of Grand-terre.

Although then the soil be open, dry, and pure, it differs little in this respect from most of the West-India islands. Most of them are light and open, and have, notwithstanding, pestiferous marshes. In a space of thirty miles of low land, with rivers and marshes, in a hot country, decomposition of vegetable matter in abundance, must take place. The steep ridge of mountains to windward shelter it from the trade-wind which would carry off the gas produced on its surface, which therefore must abound; and it is not wonderful it should be "inconceivably pestiferous throughout the whole tract;" nor that the *night land-wind*, from the mountains to the shore, should carry it down to the latter, and render it particularly dangerous to remain *on shore* through *the night.*

Dr. Ferguson mentions in a note an instance in England of a spot absolutely destitute of vegetation, which was nevertheless subject to fevers produced by marsh poison. "The point of Dungeness is a tongue of land appended to the great Romney marsh, and consists of an extensive bank of shingle or gravel, so dry, loose and open, that, even during wet weather, horses sink in it nearly up to their knees. The forts and barracks are at least four miles from what may be called the main land, where the grass begins to grow; yet was there no spot of that unwholesome tract of country more prolific of endemic fever during the hot summer and autumn of 1817, than these barracks."

It is evident, that in so hot a season as that of 1817 is stated to have been, miasmata must have abounded in this extensive tract of marshy and unhealthy country; and the access to the post at Dungeness being through it, every one passing and repassing was exposed to the operation of the unhealthy air. Moreover, the whole distance from the body of the marshy tract to the post being a flat surface, every wind which blew in that direction, must have carried the miasmata then abounding to the barracks. It is certain that in this, as in every other case stated by Dr. Ferguson, there was a marsh close at hand, in circumstances to pro-

duce the effect observed; and where there was no marsh near, as at Lisbon, there was no sickness.

It remains to explain the cases stated in which dry hills are sickly. Dr. Ferguson makes the following statement.

"The beautiful post of Prince Rupert's, in the island of Dominica, is a peninsula which comprehends two hills of a remarkable form, joined to the main land by a flat, and very marshy square isthmus to windward, of about three quarters of a mile in extent. The two hills jut right out on the same line into the sea, by which they are on three sides encompassed. The inner hill of a slender pyramidal form, rises from a narrow base nearly perpendicular, above and across the marsh, from sea to sea, to the height of four hundred feet, so as completely to shut it out from the post. The outer hill is a round-backed bluff promontory, which breaks off abruptly in the manner of a precipice above the sea. Between the two hills runs a very narrow clean valley, where all the establishments of the garrison were originally placed; the whole space within the peninsula being the driest, the cleanest, and the healthiest surface conceivable. It was speedily found that the barracks in the valley were very unhealthy, and to remedy this fault, advantage was taken of a recess or platform near the top of the inner hill, to construct a barrack, which was completely concealed by the crest of the hill from the view of the marsh on the outside, and at least three hundred feet above it; but it proved to be pestiferous beyond belief, and infinitely more dangerous than the quarters in the valley within half musket shot below. In fact no white man could possibly live there, and it was obliged to be abandoned. At the time this was going on, it was discovered, that a quarter which had been built on the outer hill, on nearly the same line of elevation, and exactly five hundred yards farther removed from the swamp, was perfectly healthy, not a single case of fever having occurred on it from the time it was built. These facts were so curious that I procured the surveyor-general of the island to measure the elevations and distances, and I have given them here from his report."

In this case it is evident that the inner hill and the clean valley could not have been the surface which produced the cause of the

fever; because the outer hill, separated only by a small valley from the inner, and manifestly as well adapted to the production of the cause of autumnal fever, was entirely free from it. It is evident that we must look to some other quarter for the source of the evil; and we cannot for a moment be at a loss for this when we consider all the circumstances.

There was a large marsh, three quarters of a mile in extent, *to the windward of the hill.* The gas generated in this marsh must necessarily have been driven up the ascent of the hill next to it, which was the inner hill, by the trade-wind which sets continually in that direction; and surmounting its shoulders, have fallen from its density into the valley between the two hills; down which, being protected by the inner hill from the wind, it quietly glided into the sea, and did not reach the outer hill five hundred yards further removed from the marsh.

Thus it was that the valley was found unhealthy; that the removal to the elevated position on the inner hill, only carried the men nearer to the source, to a situation in which the gas operated with full power as it commenced its descent into the valley; and that the outer hill was healthy because protected from the gas by the interposition of the valley, and by its distance. It is manifest, that if the troops near Galliopolis had been encamped on high ground, ascending gradually from the pond to the camp, that the gas would just as certainly have been forced along up it, and must have produced the same effect as it actually did on the level ground.

An account somewhat similar to the above, of Prince Rupert's, is given of some high grounds near Port of Spain in Trinidad. The centre of the island is an immense marsh. The heights in question arise out of this marsh, and ascend gradually as they recede westward from it. Thus situated, the gas from the marsh is blown directly along up the ascent of these heights, and over them into the sea.

The facts stated by Dr. Ferguson show, therefore, nothing more than that "malaria" is found in some places in which vegetation has been burnt up, and in some elevated and dry situations; but its existence in every case mentioned is consistent with the

doctrine advocated in this essay, there being in every instance in which disease occurred, a source of the gas in question in the neighbourhood, viz. either a marsh to windward, or pools of water; and therefore the conclusion, that putrefaction is not essential to the existence of "malaria," is so far from being legitimately drawn from these facts, that they confirm the opposite doctrine.

Exsiccation, therefore, is not essential to the production of the endemic diseases of hot weather; and we find it the result of universal experience, in all times and places, that without the decomposition of vegetable matter these diseases never occur, and that a dense gas thence arising is the cause of them.

Exhalations arising from putrefying animal matter, or from a mixture of animal and vegetable matter, have also been considered as capable of producing these diseases. Bancroft has however stated a number of facts which show decisively that such exhalations are not productive of epidemic fevers. He states that apprehensions having been entertained of danger to the health of the inhabitants of Paris from the offensive exhalations which proceeded from an old grave yard, nearly twenty thousand bodies in different stages of putrefaction, were disinterred and removed. Much of this was done in the hottest weather, but no fever was produced. During the epidemic fever of 1800 in Spain, ten thousand bodies were buried in one burying ground in Seville, and twelve thousand in three others. In the hot weather of the following spring, the earth which covered these bodies cracked open and suffered a fœtid odour to exhale. In Cadiz the churches were more or less filled with putrid emanations from the same cause. In neither case did an epidemic follow. In an establishment for the manufacture of adipocire at Conham, near Bristol in England, the entrails and useless parts of many hundred carcasses were left to putrefy on the surface of the ground; and although the effluvia were very offensive to all employed in the manufactory, the health of no one was injured in the two years during which the establishment was continued. Dr. Gordon gives an account of the putrefaction of one thousand barrels of salted beef in one of the West India Islands without producing sickness

in any person in the town or in the neighbourhood. The beef was entirely spoilt and thrown into the sea. It is the custom of many countries to manure their fields with fish; but no epidemic has been known to arise on such occasions.

These cases constitute strong evidence that exhalations from putrefying animal matter do not produce epidemic disease. It is to be considered also that the quantity of animal matter lying on the surface of the earth is exceedingly limited; being eagerly devoured by a variety of birds, beasts, and insects, in constant pursuit of it. On the contrary that vegetable matter every where abounds, and particularly in those places in which epidemics appear. It is also to be considered that the gases arising during the putrefaction of animal matter are exceedingly offensive; and that in places in which a fever prevails, there is frequently little smell, and often none. There must therefore be, in such situations, a very small proportion of the gases which arise from putrefying animal matter; and it cannot be believed that so small a quantity produces the effects observed in epidemic seasons when corresponding effects are not observed when these gases are abundant. If an epidemic fever be produced by so small a quantity of these gases that they scarce can be perceived, what terrible consequences should follow when a town or neighbourhood is annoyed, as in the cases above stated, by a most offensive smell for months?

Bad drinking water has also been considered by some as the cause of these epidemics. A single consideration will show the incorrectness of this opinion. Epidemics occur in hot weather particularly, and therefore nothing present throughout the year can be the cause of these diseases.

It has been supposed that epidemic fevers are produced by some influence of clay lands on the atmospheric air. If so, these diseases ought to continue throughout the year, whereas they appear only in warm weather. If it be contended that it requires a high temperature to enable the clay to act, the answer is, that at that temperature, in such wet soils as these clay lands generally are, miasmata arise from the vegetable matter. There is therefore present, a cause known to be capable of pro-

ducing these diseases; and there is no ground for believing that clay lands have a special influence, the same circumstances on any other lands producing the same effect.

It has been supposed that water below the surface of the earth and near to it, produces epidemics. The same objection that was made to the two last mentioned alleged causes, is equally opposed to this. When water is found a little below the surface of the earth, it is not in one season only but throughout the year; whereas epidemics appear chiefly at one season; or if there be a season in which this subterraneous water is not to be found, or is scarcer than common, it is in that very time when epidemics prevail, viz. in hot dry weather. Countries so situated as to have water within a short distance of the surface, are for the most part marshy, and hence, in dry warm weather, the cause of the diseases which prevail.

A moist air has been by some considered a cause of epidemic disease. But in the moist climate of Holland wet summers, when the air is particularly moist, are the healthiest, and dry summers the most unhealthy.*

Dryness of the atmosphere has also been considered a cause of these diseases. It has been alleged in support of this opinion, that the long prevalence of hot southerly winds, has at all times and nearly in every country, been occasionally productive of epidemic disease; the mortality during an epidemic vastly increasing during a southerly wind, and on the recurrence of a north wind a correspondent diminution taking place, till the disease is extinct. This statement is true, and yet affords no foundation for the opinion that dryness of the atmosphere produces epidemic disease. Winds are wet or dry, in every region, according to its situation with respect to the sea, or any large body of water; and on this account, in all the south of Europe and of Asia the south wind is not dry but moist.

It is an unanswerable objection to this or any other condition of the atmosphere being alone the cause of the autumnal or hot weather epidemics, that while the former is general in its ope-

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*Pringle on the Diseases of the Army, p. 82, 184.

ration, the latter are partial in their appearance; being more violent in one place than another, desolating some spots, while others at a short distance escape altogether. So partial an effect cannot flow from a cause general in its operation.

Thus while in Italy and other marshy countries of Europe, in the island of Sardinia, and in the West-Indies generally, dry weather produces violent epidemics; in some of the West-Indies, in Senegal, &c. it is healthiest in dry weather, and very sickly in the midst of incessant rains. In this whole country, the dryest years are the healthiest except in spots, and these are the wettest spots in the country.

A rarefied state of the atmosphere has been mentioned as a cause of epidemic disease. A number of morbid symptoms have been experienced at the top of high mountains, and attributed to the rarefied state of the atmosphere in those elevated situations; and it is argued that such symptoms must be produced whenever such a state of the atmosphere exists. True; but when does it exist on the surface of the earth at the ordinary level of human habitations? If this doctrine were true, elevated situations would be the most sickly and low ones the most healthy. It is liable also to the same insuperable objection with some of the preceding, that the phenomena are two partial for so general a cause.

How totally inconsistent with the nature of any of these alleged causes, are the occurrences among the troops at Galliopolis? There the cause, from its density, took its direction from the wind, and its presence being ascertained by its effects, it was traced to the spot where it originated; to the windward of which its effects could not be observed.

Comets have of late years been seriously proposed as the chief cause of epidemics. The absurdity of the idea will appear at once if we consider, that they appear in winter as well as in summer, while most epidemics occur in hot weather; that comets continue to appear as in former times, but the epidemics of Europe are much less violent since that continent has been better cultivated, drained, &c.; that epidemics if produced by comets, ought to be universal in the earth, which is not the case; that epidemics often occur before, often after, the appearance of comets, some-

times a whole year: now if they appear because of the approach of comets, they ought to be more and more severe the nearer these bodies come; but these diseases are often over before they approach nearest: if it be said that epidemics occur because of the going off of comets, then ought the former not to appear before the nearest approach of the latter.

It is evident therefore from all that has been said, that there is not sufficient ground for believing that the epidemic diseases of hot weather are produced by a gas arising from putrefying animal matter, or by bad drinking water, or by the influence of clay lands, or by subterraneous water, or by a moist air alone, orby a dry air alone, or by a rarefied state of the atmosphere, or by comets; but that we have abundant reason to believe that these wasting pestilences are the effects of a dense gas, the product of the decomposition of vegetable matter.

The next question in the regular prosecution of this inquiry. relates to the effect of this agent on the human system. This has, however, been the subject of consideration in the paper before alluded to,* and need not be repeated here. Suffice it barely to state the substance of what is given on the subject in that essay.

The agent in question, commonly distinguished by the name of miasmata, causes the blood of those who are exposed to its influence to be of a darker colour than common. Goodwin's experiments on the connexion of life with respiration show, that when the blood is dark-coloured, it does not stimulate the heart to as vigorous action as when it is of the usual colour; and therefore that under the influence of this dark-coloured blood, the action of the heart is weakened. Weakened action of the heart is actually observed always to occur in the commencement of autumnal diseases. This state of the heart necessarily and inevitably produces accumulation of blood in the vena cava and its great branches. Internal congestion or accumulation is also observed actually to occur in these diseases. Accumulation of blood in the vena cava cannot exist without extending into the large veins of the head, the liver, the stomach and bowels, and the kidneys; and

*Transylvania Journal of Medicine &c. vol. 1. p. 80, &c.

consequently affecting all these parts. Universal experience shows that they are all affected in the diseases in question. From accumulation of blood in the interior and its consequent absence from the exterior, must also result paleness, shrinking and diminution of the temperature of the external surface; while the sudden presentation of an increased quantity of blood to the heart, must excite that organ to increased action, if it be capable of it at the time.* These effects are also observed to occur in connexion with the others, above stated, in the diseases produced by the agent in question.

It appears therefore that this agent, miasmata, by rendering the blood dark-coloured, weakens the action of the heart; the consequences of which are weakness of the pulse, diminution of the bulk of the external parts of the body, shrinking of the features and of the skin, paleness and coldness of the surface; together with accumulation of blood in the vena cava and its branches, whence arises pain in the head, comatose affections, convulsions, delirium, disordered secretion of the liver, nausea and vomiting, want of appetite, disordered bowels and kidneys, the convulsive agitation of ague, and increased action of the heart, which produces increased colour, temperature, and bulk of the external parts.

These symptoms, with some others arising from the same cause, constitute the paroxysm, viz. the cold and the hot stages of a fever: they are moreover the leading features, present in all autumnal diseases. Sometimes one part, sometimes another, is more affected; and these differences give rise to distinguishing names. These it is proper to retain for convenience, but we shall be led into error if we lose sight of the fact that the above are the leading features of every form.

In the further prosecution of this subject, it is proposed to show that the same cause produces all the forms of autumnal fever; that in all of them the same internal state is produced, the same general train of symptoms or leading features occur, the same mode of treatment is required, and the same obstacles to effecting it, occasionally exist, and are to be overcome in the same way.

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*Transylvania Journal of Medicine &c. vol. 1. p. 85. 86.

It would be a repetition of what has been already said on the subject of the origin of autumnal epidemics, to go into a statement of facts concerning the cause of each of the different forms of these diseases. Suffice it to make some general statements, the truth of which every man who reads them, will be ready to attest; and which when brought to his recollection, will at once convince him that all the forms of autumnal disease, arise under the influence of the same cause.

All these forms, intermittent and remittent fever, dysentery, diarrhœa and cholera, arise at the same time of the year and in the same circumstances and situations. They are all more severe in very hot climates; in temperate climates they all appear in hot weather, and decline in cool weather. Moisture as well as heat is necessary to the production of all of them.* Heat and moisture are not sufficient to produce any of them without the presence of vegetable matter. A single fact shall be stated to set this matter in a clear and strong light. Two vessels lay at the island of Bulama on the coast of Africa in the year 1792, during the rainy season. Some hundreds of men, women, and children were confined on board by the rain; and the weather being hot, they soon became very sickly and numbers died. Within the small compass of these two vessels were to be seen all the forms of autumnal fever; remittents, some of them of the highest grade, destroying the patient in a day or two, intermittents, cholera and dysentery.† This fact is so striking as to convince, to constrain us to believe, that the same cause produces all the forms of autumnal disease.

This cause produces the same internal state in all these affections. This is evinced by the weak pulse, the pale and shrunk surface and diminished temperature, observed in the first stage of all the forms. This state of the pulse and of the surface, indicates weakened action of the heart, which cannot exist without being followed by an accumulation of blood in the interior veins; and this internal verous congestion is known to exist in all the forms of autumnal disease.

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*Cleghorn's Obs. on the Dis. of Minorca, see the whole 2nd chapter.

†Medical Repository of New-York, vol. 1. p. 475.

The accumulation of blood in the vena cava and its branches, existing in all the forms of autumnal disease and necessarily affecting the same parts in all, the same general train of symptoms or leading features occur in all these diseases.

In the commencement of every one of them we observe the symptoms constituting what is called the cold stage of a febrile paroxysm. This stage, in all the forms, is generally followed by increased action of the heart, constituting the hot stage. The hot stage moderates more or less, or entirely subsides in a few hours. The remission or intermission is again followed by increased action. The remission is sometimes very slight, at others so perfect that for some hours or even for a day the patient is flattered with a hope that his disease is at an end. This is the case in dysentery as well as in fever.*

The parts principally affected are the back, the head, the breast, and the epigastrium.

The pain in the back is often most severe in the cold stage, moderating as the fever rises.

The head is very generally, perhaps universally, more or less disordered. Pain and confusion of intellect exist in every degree, from that in which they are little regarded, to one in which the patient is ungovernable or stupefied.

The breast is the seat of oppression accompanied by efforts to get rid of it by full inspiration, with anxiety and great apprehensions of danger.

The epigastrium is the seat of tenderness, from a degree so slight as not to be noticed by the patient till pressure is made, to an intolerable soreness and burning, accompanied by fruitless efforts to vomit.

The discharges from the bowels are of various colours and consistence. Sometimes the bowels are obstinately constipated; at others there are frequent green or black discharges.

The urine is of various colours from a deep yellow to a very dark and almost black, precisely such as is seen when dark coloured feces have long remained in a vessel of urine.

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*Cleghorn's Obs. &c. p. 123. 236.

Every one of these symptoms has occurred in all the forms of autumnal disease that I have witnessed for twenty-five years past: and every practitioner of experience and observation will assent to the truth of the assertion as far as his experience extends.

It is true that different cases are distinguished by one having a higher degree of this, and another of that sympton. Some have a greater, and others a less degree of remission of febrile action every day. In some cases the bowels are very irritable so that large doses of medicine are required to produce evacuations; in others smaller doses will produce great effects. Sometimes the bowels are so irritable and the secretion of bile so free, that without medicine bilious evacuations are as abundant as in others from the administration of cathartics. In some of these cases, after the ordinary contents of the bowels are passed off, the mucus which lines them is discharged, at first in its natural state and finally more or less tinged with blood. This irritable state sometimes extends to the whole tract of the alimentary canal, and at others is confined to one or other extremity of it.

These differences give rise to the distinguishing names, remittent, intermittent, diarrhœa, dysentery and cholera. But though the different forms are distinguished by them, they do not constitute the disease. Thus, that form in which the bowels are so irritable as to discharge first the ordinary contents of a greater or less portion of them, and afterwards mucus or bloody mucus, is called dysentery for the sake of distinction; but it is evident that this symptom does not constitute the disease: besides this, there are to be seen all those above mentioned as the leading features of autumnal epidemics. We even find in many cases that this symptom does not appear for some days after the others.* Before it appears the case is not to be distinguished from the general mass of cases of autumnal fever; and after its appearance, if by proper remedies it be speedily removed, the case cannot be distinguished from others in which the symptom never appeared, and no man can by any means discover that it ever existed.

The same may be said of every other form. Intermittents

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*Cleghorn's Obs. on the Dis. of Minorca p. 1. of Chap. v.

become spontaneously, or they may be made to become remittents, and remittents intermittents; dysentery becomes a remittent or intermittent, and remittents and intermittents assume the character of dysentery; cholera becomes an intermittent or remittent, and vice versa.

These statements are confirmed in every point by the testimony of Cleghorn and Pringle.*

The same internal derangement existing in all the forms of autumnal fever, and the leading features or symptoms, effects of this internal derangement, being the same in all, the same mode of treatment is proper in the whole of them; and the difficulties in prosecuting the treatment, are the same, and are to be overcome in the same way.

The remedies commonly used in the treatment of autumnal fever are bleeding, vomiting, purging, blistering, the warm bath, and tonics.

In every case of fever in which the pulse is strong and tense, the good effects of letting blood are manifest to all who have made the trial. In these cases it is often necessary to take blood to obviate immediate danger; and it is almost always advisable, in order to prevent the prostration of the system which follows excessive action of the heart and arteries. It should be carried to the extent of making a sensible impression on the colour of the countenance or on the pulse; and should be repeated, so as to ensure the effect desired, the reduction of the violent action of the heart, without regard to the number of bleedings in the same day. I have frequently advised bleeding repeatedly in the same day when the pulse continued strong and tense, or when that state returned in a short time after being softened by the previous bleedings.

In cases in which the pulse is not so strong, but still more so than natural, bleeding is often advisable when it may be and is dispensed with. It favours the operation of cathartic medicines, and is effectual, in a few minutes, in the reduction of a degree

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*Cleghorn's Obs. on the Diseases of Minorca p. 123. 130. 146. 151. 155. Pringle's Dis. of the Army, Part III. Chap. 4, Chap. 6, § 3.

of increased action, which may not with certainty be accomplished in hours or days by any other means.

In cases in which the pulse is moderate or even smaller than common, bleeding is sometimes beneficial; particularly when the head or the bowels are affected with violent pain, or the lungs greatly oppressed. In these cases the patient is often pale, and there is some doubt of the safety of taking blood; but if he can bear the loss without the pulse sinking, he will be greatly relieved. In the commencement of an attack, if the pulse, though small and not strong, be somewhat slow and regular, and be not varied by change of the position of the patient from a lying to a sitting posture, bleeding may be tried. If the pulse, which ought to be felt during the whole time, do not fail at all, the bleeding may be continued. In such cases the pulse sometimes increases in force after a short time, sometimes even during the operation.

A lady with intense pain in the head, pale cool skin, and weak pulse desired me to bleed her. Fearing to venture, I advised her to take a cathartic; it operated five or six times, but the pain continued. Still insisting on being bled, though much in the same state as in the morning, her wish was complied with and she was considerably relieved. Some time afterwards, she was attacked again in the same way. The pain was very severe, the skin pale and cool, the pulse weak but regular and slow, and not altered by rising and sitting up. About a pint of blood was taken from the arm, the pulse not lowering, and on taking off the ligature it was troublesome to stop the blood. She was about in a day or two.

The affusion of cold water upon the whole of the body, or upon some principal part of it, as the head, is likewise a very effectual and speedy mode of reducing the action of the heart.

Emetic medicines in nauseating doses are another effectual means of reducing increased action.

Emetics are sometimes useful in autumnal fevers merely as an evacuant. They discharge a quantity of bilious or other matter, which from the position and shape of the stomach, is sometimes retained for days, exciting great nausea. They are also useful

in the forming state of fever: given in the approach of the cold fit, they often prevent it. In the access of the paroxysm of fever the patient sometimes is affected with a sense of suffocation and labours for breath. In these cases emetics are very useful in affording relief for the time. Administered in the fever so as to produce free vomiting they often break up the paroxysm, and there is no doubt but a fever may sometimes be cured by repeated emetics. They, however, produce injurious effects when administered in such a manner as to cause excessive purging of a serous fluid. Such a purging I have known terminate in death in two days, and the misfortune is that the cases in which emetics will act in this way, cannot with certainty be distinguished.

Cathartics are the main dependance in the treatment of autumnal fever. They have generally been considered useful in proportion to the quantity of the discharges they produce; and as any one of the class may be made to act on the bowels, it is too common an opinion that excepting calomel, one is nearly as good as another. Hence it is that physicians often prescribe a dose of calomel at night, and direct the patient to take in the morning any thing he likes best to assist the operation.

It cannot however have escaped the attention of men of observation, that free purging sometimes gives little or no relief; that notwithstanding the most active employment of cathartics, the patient gradually sinks into stupor, with eyes suffused, &c.; and that the symptoms produced by congestion or accumulation of the blood in the interior veins, are sometimes rapidly increased by the active operation of a single cathartic. Neither has it escaped their observation, that in those cases in which cathartics are useless or injurious, the discharges are serous; and that all the unfavorable symptoms are at once mitigated by the discharge of consistent and dark-coloured matter from the bowels.

There is no difficulty in explaining why evacuations of this nature produce greater benefit than serous discharges. We have seen that in autumnal diseases there is an accumulation of blood in the vena cava and its great branches, producing disorder in the different parts with which those branches are connected. It is evident therefore that lessening this accumulation must have

the effect of alleviating the symptoms dependent upon it. The communication between the branches of the vena portæ, those of the venæ hepaticæ and the biliary ducts, is so free, that if either of them be injected, the others will be filled. It is manifest therefore that discharges from those ducts directly lessen the quantity of blood accumulated in those veins and in the vena cava, &c. and must, therefore, necessarily alleviate the effects flowing from that accumulation. On the other hand serous discharges are poured out by the capillary vessels opening upon the internal surface of the intestinal canal, and consequently proceed from the arterial system: such discharges it is well known weaken the pulse, which is a certain indication that the action of the heart is weakened; and weakened action of the heart is inevitably followed by increased accumulation of blood in the vena cava, &c. and consequently by an increase of the symptoms dependent upon or flowing from it.

In the choice of a cathartic therefore, we should consider it indispensable that it be capable of producing evacuations from the biliary ducts, and that cathartic which best effects this purpose should be preferred to all others, unless some greater injury is liable to arise from its administration in sufficient quantity, than that under which the patient is suffering.

From long and constant observation and from many experiments, I consider the medicines in common use as standing in the following order, in reference to their fitness to effect this object, the most effectual being first mentioned; viz. calomel, aloes, rhubarb, jalap, scammony, colocynth, senna, calcined magnesia. Salts of all kinds, oil and gamboge are little adapted to this end. In some cases either of the three last mentioned will, in a degree, answer the purpose; but in general, particularly after free purging has been once or twice effected, oil only discharges what may be in the intestinal canal, and if there happen to be nothing there, it frequentlyly passes off unaltered and unmixed with any thing; while gamboge and salts produce an immense serous discharge, at first coloured by the contents of the bowels, but transparent if the medicine be continued.

Calomel is slow in operation often requiring twelve hours: it

does not operate frequently, but the discharges are large. It gripes little or none in general, and is perhaps the most effectual medicine known, in producing consistent discharges from the biliary ducts.

Aloes resembles calomel in its operation more than any other vegetable cathartic does. I have given a considerable dose of calomel for several days in succession, and to the same patient for as many more days the same number of grains of aloes; and from the result of these and other experiments with rhubarb &c. I am convinced that aloes is the best substitute for calomel, with reference to producing consistent bilious discharges. It resembles it in being slow to operate, in not operating more than once or twice freely, and in griping very little in general. A very strange idea prevails that the action of aloes is limited to the lower part of the bowels, and even to the rectum, and hence it is objected to as likely to produce hæmorrhoids. This idea may have proceeded from the small dose commonly given, having usually no further effect than to unload the rectum. The same is however observable on giving almost any cathartic in a small dose. Calomel, rhubarb and occasionally jalap, act in the same manner. Aloes however, as well as the rest of these, in large doses operates more freely, producing several loose bilious passages. That aloes acts on the rectum alone is impossible, because it is very soluble in however dry a state it may be; and therefore must be in a situation to act immediately on being taken into the stomach: that it is brought into a fluid state in the stomach is evident when it happens to be thrown up a short time after being swallowed. The discharges produced by aloes are also more purely bilious and acrid than those produced, perhaps by any other; which certainly shows it acts on the upper part of the bowels and the liver.

Rhubarb is the next, of the vegetable cathartics, to aloes in its influence over the secretion of bile. In doses of five or ten grains it acts very much like the latter; but it is not quite so certain or effectual in producing consistent discharges. In large doses it produces a more abundant and liquid discharge.

Jalap in small doses is less certain to operate than rhubarb. In

large doses it is more active, the discharges being larger, and more liquid, but still of a cast decidedly bilious.

Scammony is much more active than jalap, and much like it in its operation, but less nauseating.

Colocynth is also much more active than jalap, but produces more nausea and griping. The infusion of senna is also very active, and produces more griping than jalap. The calcined magnesia produces similar thin discharges, except in small doses.

Of these medicines calomel being the most effectual in producing discharges from the biliary ducts, and being also tasteless, the dose small in bulk and weighty, whereby it is retained when other medicines are rejected, would be used to the exclusion of all others but for the danger of ptyalism. The necessity of limiting the use of this medicine, so far as to avoid this disagreeable effect of it, leads to the employment of different cathartics in conjunction with it. With this in view it is reasonable to believe that the medicines most similar to it in operation should be selected; and after long and very particular attention to this subject, I am entirely persuaded that the best combination that can be devised to produce free, yet consistent evacuations from the liver, in most cases, is the following, viz. equal quantities of calomel, aloes and rhubarb, made into a mass for pills with water alone. Each pill may contain two grains of each of these medicines, and will not be large if nothing but water be used in mixing them. In general three or four such pills operate in eight or ten hours without nauseating or griping, and produce about three passages.

If a patient be liable to be salivated, each pill may contain but one grain of calomel; or this medicine may be entirely left out. There is, perhaps, no substitute for calomel equal to the aloes and rhubarb. In many cases this combination effects the object in view very well; but it is not as effectual in producing dark-coloured passages as when calomel is added to the other two, this addition ensuring the object when the aloes and rhubarb alone have failed.

In some cases it is found that two, three, or four such doses do not operate on the bowels. In these cases it is necessary to in-

crease the dose or use some more active ingredient than the rhubarb. Patients generally prefer the latter. With this view jalap may be substituted for the rhubarb in the preceding prescriptions: this combination is very active and produces very abundant dark bilious passages, of thinner consistence however. Jalap and rhubarb mixed, and used in place of either singly in these prescriptions, form a very useful combination of the qualities of the two: the compound is more active than the rhubarb alone, and less nauseating than jalap, the effect being a medium as to consistence. Sometimes jalap nauseates excessively; scammony may then be used instead of it.

All these combinations mix perfectly well with water alone, into a mass fit for pills. Some gentlemen who have used them, have complained of the bulk of the pills. On inquiry I found they had used some other ingredients, as flour, soap, &c. No addition is necessary.

Sometimes the patient is distressed with a burning produced by the acrid bile brought into the intestines by these cathartics, particularly by the pills of aloes, rhubarb and calomel. This is readily relieved by omitting the aloes. A small dose of magnesia will also relieve the burning in a short time: these medicines increase the fluidity of the passages, and thus render them less acrid.

Even these active medicines sometimes fail: in these cases equal quantities of scammony and calomel may be used: I have sometimes found the addition of the eighth of a grain of tartarized antimony to each pill, very effectual.

A very active cathartic may be formed of calomel and tartarized antimony, or ipecacuana. The former is particularly valuable in the cases of children, inasmuch as the taste is so little offensive to them. This compound has the advantage of contributing to relieve by reducing the pulse. The calomel may be given at a single dose, and the tartarized antimony in divided doses afterwards. It is to be observed however that the nausea which is apt to be produced by the last is very disagreeable; and as the other mercurial cathartics mentioned, effectually answer the pur-

pose, and in a more pleasant way, I have seldom used the antimonials for a long time.

The object in going into this detail is not only to state the prescriptions which have been found best adapted to produce consistent passages from the bowels, but likewise to manifest how important a matter I conceive it to be, ever to have this object in view. I never consider a patient safe until he is brought to discharging freely from the biliary ducts; and if this can be effected pretty early and the discharges can be maintained, I consider him safe.

The best time for giving a cathartic is a point of some moment. In order that the evacuations may be most serviceable in reducing the febrile action, the medicine should be administered in such a manner as to operate during the fever. They should therefore be given during the remission. It is always best to administer such a dose at once as will be pretty certain to effect the object in view. Thus, if it be found on trial that four pills given in the morning do not operate sufficiently, and that it becomes necessary to give a second or third dose; on the day following, it will be advisable to give six or eight at once if the patient will make the effort to swallow them. An effort is all that is required: six or eight pills can easily be swallowed at once, with a little attention. The best way is to hold a little water in the mouth, and pour the pills far back into the throat out of a dry spoon or wine glass.

Under the daily operation of these medicines, the discharges from the bowels, at first of a dark brown, a black or a dark green colour, gradually become lighter in colour and finally yellow. During this process the symptoms also become more and more mild, and in almost every case they disappear by the time that the passages become yellow. The febrile action is carried off in most cases before this is effected; but other effects of accumulation of blood in the vena cava and its branches, viz. derangement of the functions of the liver, the stomach, &c. continue. But as soon as this congestion is reduced so that the secretion of the liver becomes natural and healthy, the appetite returns; because

the veins of the chylopoietic glands all contributing to form the vena portæ which supplies the liver, these glands are all in like manner affected by accumulation of blood in the interior veins; and the same degree of fulness which produces a healthy secretion in the liver, produces the same in the stomach, and the appetite and power of digestion return with the appearance of natural-coloured passages.

The patient is now convalescent, but the medicines should not be laid aside, unless indeed, as sometimes happens, the bowels become so open as not to require aid. If however he should not have one or two copious consistent passages in the day, he ought not to fail to procure them by a sufficient dose of the pills of aloes, rhubarb and calomel. Treated in this way patients rapidly recover and have a fine complexion very soon after rising from bed. It will not be questioned that a convalescent with a good appetite, recovers faster if he happen to have his bowels in such a loose and easy state as that abovementioned; and if he have them not in this condition, can any thing be more certain than that bringing them into this state will promote his recovery?

There are some symptoms which occasionally occur in these fevers, deserving of particular notice. One of these is stupor. When the pulse is strong, there is no question of the propriety of evacuations in this case, and therefore nothing further need be said respecting it. When however the pulse is moderate or weak, some may be disposed to doubt the propriety of such remedies, and to rely on blistering and irritating applications to the feet, &c. The effect however of a free evacuation of dark bilious matter in such circumstances, is surprizing.

I was desired to visit a patient and found him affected with stupor and an uneasy feeling in the abdomen. He had been ill a fortnight. His physician informed me that he had attempted in vain to purge him, that he had blistered the abdomen without advantage, and that he was now resting all hope of saving him on a salivation. He was advised to return to his first plan and give him a large dose of scammony and calomel. He took half a drachm of each that night. Early next day we found he had

had six large dark-green passages, and was much better. These medicines were continued and he rapidly recovered.

Another man had been ill for some days. I found him in a stupor, unable to speak, and with a complexion of a dark yellow colour. On being asked if he felt pain, he made an attempt to put his hand to the pit of his stomach, but was not able to direct the effort properly. His pulse was somewhat strong and full. With hesitation I ventured to bleed him: he was not relieved by it. The attending physician was advised to open his bowels effectually. This was done with scammony and calomel in considerable doses: the passages were free and black: next day he was so much better as to be able to converse on his situation. The third day he was again found in a stupor and in extreme danger: his nurse had neglected giving him his medicine, and there had been no evacuation from the bowels. His brother then determined to remain with him. The same medicine operated well, the stupor disappeared immediately, and the course being continued he recovered.

A man, seventy years of age, was affected with stupor, and had at the same time bilious diarrhœa; the passages were of a dark green colour. His pulse was active. He took mercurial cathartics every day for about a week with marked benefit; and he perfectly recovered. The spontaneous discharges might have cured him; but as he was an old man, it was thought best to hasten his recovery by rendering them more copious. His son Dr. Sutton I. Harris of Frederick county Virginia, was attending to him at the same time.

Stupor is a very common symptom in children who are affected with autumnal fever. When it is very considerable, the child is said to have hydrocephalus internus. It is accompanied sooner or later, sometimes from the beginning, by enlargement of the pupils, insensibility of light and even blindness; or by contracted pupils and great sensibility of light, with pain and convulsions. These symptoms, however, are all such as an accmulation of blood in the vessels of the head is capable of producing; such accumulation is present in autum-

nal fever, and is to be seen when the patient dies; at the same time that an effusion of water is sometimes at least, not to be found; perhaps, rarely exists. "Dr. Quin has given a dissection of a child that died with all the symptoms of hydrocephalus internus, and yet nothing was discovered in the brain but a slight turgescence of its blood-vessels."* It appears also from Morgagni's account of the dissection of a great number of bodies, that accumulation of blood in the vessels of the head, sufficient to render them turgid, exists in almost every case in which serous effusion is found.† Lastly effusion of serum in great quantity sometimes occurs without the appearance of the symptoms attributed to it.‡

Inasmuch therefore as the symptoms relied on as evidence of the existence of serum in the cavity of the cranium, are such effects as increased fulness of the vessels of the brain and its coverings is capable of producing; as even when serous effusion is observed, increased fulness of the vessels of the brain is also present; and as in some cases, dissection shows that increased fulness of those vessels, but no serous effusion is present, it is evident that the former and not the latter is the cause of the symptoms in question, at least in most cases.

This conclusion is strongly confirmed by the fact, that when there is a free evacuation of bilious matter from the bowels, the child is manifestly relieved of all the symptoms, and, this ceasing, they return again in a few hours, and again disappear on a repetition of the bilious evacuation. These marked changes, repeated in a short time, are entirely inconsistent with their depending on effusion as their cause, which cannot so suddenly be removed and return again: but it is perfectly consistent with dependance on an accumulation of blood in the vessels of the head, which can by such evacuations from the liver and therefore from the vena

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*Rush's works, vol. 3, p. 58.

†Morgagni of the Seats and causes of Diseases, Let. I. art 26.—Let. II. art. 9. 17. 20.—Let. III. art. 4. 6. 14. 24. 26.—Let. IV. art. 4. 13. 19. 24. 28.—Let. V. art. 6.—Let. VI. art. 6.—Let. VII. art. 4. 9.—Let. X. art. 17. 19.—Let. XI. art. 2.—Let. XXI. art. 7. 33.—Let. XXIV. art. 6.—Let. XXV. art. 10.—Let. XXXI. art. 2.—Let. XXXV. art. 16.—Let. LX. art. 2. 10. 12.

‡Ibid. Let. I. art. 7.—Let IV. art. 3. 29. 35. 36.

cava and its branches in the head, be reduced, and can return in a short time.

The treatment of children in this situation, is precisely the same as that of adults. Bleeding ought not to be omitted if the pulse admit; but a copious discharge from the liver is the most effectual means of removing this affection of the head. Indeed so important is this evacuation, that, provided only the pulse be moderated by bleeding if necessary, by it *alone* the child will be saved, and without it perhaps nothing can save him.

Convulsions sometimes occur in autumnal fevers. They sometimes accompany the last mentioned symptom. They occasionally appear in the commencement of an attack, sometimes in the course of it. Whenever they occur the patient should be freely bled if the pulse be strong and hard: but if soft, though full, bleeding is improper, and likewise if the pulse be weak. A lady riding out had a convulsion in her carriage. She was bled freely and vomited. She was next day able to return to town and desired me to visit her. Her pulse was full and very soft. She wished to be bled. This was objected to, on the ground that the further weakening the action of the heart, would tend to increase the accumulation of blood in the interior veins, and very probably produce convulsion. She was purged with mercurial cathartics, and discharged black matter pretty freely. After continuing to do so four days, she prevailed on me to bleed her, and while the blood was running she was seized with a violent pain in the head, and fell into convulsions. The patient should therefore not be bled when the pulse is weak or very soft. While the convulsions continue it is exceedingly difficult to get him to take any thing: but by watching closely a moment may be seized to pour down a solution of tartarized antimony. Half a *scruple* is not too much for an adult, but it should be instantly followed by large draughts of warm water, or tea, which the patient will drink when he will not swallow water, repeated without interval until the whole is thrown up. At the moment this is done, the patient becomes somewhat sensible, and not a moment should be lost in administering a dose of jalap and calomel. As the case is urgent, and another opportunity may not occur for many hours

afterwards of repeating the dose, a large one should be given. In such cases, when called to patients who had been for many hours almost without interval convulsed, half a drachm of calomel and as much jalap has proved in a short time decidedly beneficial. After a free operation the patient is relieved, and the case proceeds as other cases of fever.

As in individual cases, sometimes the head, sometimes the back, is more affected, so in some seasons these parts are affected in most of the cases. In 1825 stupor or delirium or both, were common in adults. The children also had the same affection of the head, *which was called hydrocephalus.* In some seasons, in like manner, the back is principally affected, and the attention of the patient, and too often of the physician, is drawn away from the true nature of the case, and the disease often terminates fatally while efforts are making to relieve the affection considered merely as a local one. In both the one and the other the affection of the part, is but a symptom of the general disease. The part is no doubt affected, but the affection depends on the same cause with the other symptoms, and stands or falls with them. The treatment therefore of these cases is the same with that of autumnal fever in general. I have not room to state facts here to establish this view of the nature and treatment of these affections, but state as the result of my observation and experience that these and all similar local affections, during the season of epidemic diseases, are to be most successfully treated as cases of autumnal fever.

There are some other symptoms which occur in fevers of low grade. Fevers of the lowest grade of action are successfully treated in the same way, except that bleeding is not admissible, and that instead of the affusion of cold water, that of warm or tepid water should be used. Catharties are the main dependance; and when the action of the heart is very weak and quick, those cathartics which produce discharges of considerable consistence are more especially necessary. Such cathartics are considerably stimulant: it is however sometimes proper, and even occasionally necessary, to use stimulants with the cathartics; but rarely after dark-coloured consistent passages have been procu-

red. There is not a symptom belonging to these low fevers which is not carried off by such cathartics.

In the year 1806 I had a patient in a low fever, with delirium, subsultus tendinum, &c. whose life was by his friends despaired of, but under the daily operation of mercurial cathartic pills, he discharged black bilious matter, and recovered perfectly in two or three weeks, without any other medicine than occasionally an opiate with vol. alkali.

In the year 1808 I had a patient lying much in the same situation, who was however excessively weak, and lay attempting to pick off spots which he supposed he saw on the bed-clothes. He was taking mercurial cathartics every day and discharging black matter, when he was one day visited by an elder physician, who advised that the cathartics had been carried too far and that he should take bark and wine. He however continued the cathartics and recovered without bark.

In the year 1816 I was desired to visit a patient of twelve years of age who was very ill: there was another of about the same age lying in the room, who was not very ill, and whom the family undertook to manage. On the second day however she likewise was put under my care. The one first mentioned took a cathartic every day without any objection from the family, it being admitted that she was dangerously ill; and in twelve days without any other medicine she was entirely well.

The other took a cathartic two mornings, and was so much better on the third that the family declined giving her any thing more. She was sitting up, but could not eat. On the next morning she was on the bed again, and on the morning following was compelled to return to taking medicine. In two or three days she was again sitting up, and the family again considered medicine unnecessary. In two days more she was compelled to begin again. By this time however she had become seriously ill. She continued taking mercurial cathartics alone, the discharges being excessively fœtid. Not bearing in mind that their own interposition had been the cause of the length of her illness and fearing she would die, the family at length desired the aid of a physician, a relative of theirs, in consultation. He, using lan-

guage very common on such occasions, observed that the practice had been very proper, but that as she was in a typhous state, the cathartics should be laid aside and she should be stimulated. As the whole party were now opposed to my views, and particularly as it had been frequently declared by neighbouring physicians that continued purging was not necessary even in fevers of considerable action, and that in these fevers, on their own experience and that of writers of high authority, bark, &c. were proper, I was well satisfied that the point should be fairly tested. The patient was therefore, under my direction, most faithfully stimulated with brandy, wine, bark, blistering plaisters, &c. for a week. She commenced this course weak and low enough; but at the end of the time mentioned she was decidedly weaker and lower; and her death was pronounced to be inevitable. In this state of things I protested against pursuing the stimulating plan any longer, and, no objection being made, I returned to the cathartic plan of treatment. She took a dose of rhubarb and calomel every morning, sufficient to operate two or three times until she perfectly recovered. She took nothing else except an anodyne occasionally at bed time. It is worth while to observe that these were the first patients I had in that family, and that I never had such difficulty in families in which the practice had been followed. The good effects silenced all opposition.

In the same year I had nine patients in one family. The master had a high fever, was bled several times, purged freely and recovered. All the rest but one had fever of ordinary grade, requiring cathartics without bleeding, and recovered. The one excepted had a weak, quick, soft pulse, moderate heat of the skin, mild delirium and subsultus tendinum. Continued mercurial cathartics cured him also. One morning he was more delirious and had more subsultus tendinum and tremor than the day before. Having had my mind much engaged about this time, as above intimated, respecting the propriety of purging in these cases, I was very attentive to the effect of every dose. Finding him with an increase of what are called nervous symptoms or symptoms of typhus, I was sitting observing him and reflecting on his case, when his mistress came in and said that she had ne-

glected giving him the last dose of medicine left for him. This information settled the point, and the cathartics were continued daily until he was perfectly well. He took nothing else.

A gentleman, in 1821, consulted me respecting his brother who lived so far off that I declined visiting him. He however undertook to give me daily information of his situation. He had been ill for some days and had been taking calomel and opium. He lay in a comatose state, with a weak quick pulse. Some pills of calomel, scammony and camphor were sent, with directions to give him four every two hours, until they should operate. Such were his brother's fears from a practice so different from that which had been followed before, that he only ventured to give him two pills at a time. He took several doses before they operated. The discharge was copious and black. He immediately after the first passage recovered from the stupor, and conversed with considerable animation. The mercurial cathartics were continued daily and he perfectly recovered.

In the present summer, a negro girl, thirteen years of age, had a black tongue, delirium, hurried manner and respiration, anxious countenance, pain in the right side on full inspiration, dry cough, excessive soreness of the epigastrium, a pulse quick and varying in force very much in the course of the day; she was sometimes hot and sometimes so cold as to require hot applications to her abdomen and extremities; she had such a disposition to watery passages that a small proportion of ipecacuana or of rhubarb with the calomel, made them very much so. Calomel alone, in doses of half a scruple, three or four times a day, rendered the discharges more consistent. After continuing this for several days, she took aloes and calomel, of each ten grains, three or four times in twenty four hours, the rule being to repeat the dose every three or four hours until the effect was produced. She continued this prescription for a week. The passages became more and more consistent, were black for several days, then green with a mixture of yellow, and finally yellow. She manifestly mended every day. When she began, it was necessary to use hot applications to the feet &c. once or twice a-day: in a few days this was forgotten; she acquired composure; the delirium disappeared,

also the hurried respiration, the pain on inspiration and the cough, the soreness of the epigastrium, the blackness of the tongue, and she had a great appetite. She took no other medicine and used no blistering plaister.

In these low fevers hæmorrhages from the stomach and bowels, with petechiæ on the skin, are not unfrequent. These discharges sometimes appear in the commencement of the attack, sometimes in the course of it: they are often, perhaps generally accompanied by purple spots on almost every part of the surface. Some of these are of a light purple colour; others of all the different shades to a deep purple. They are of all sizes and of various shapes. When the cuticle is broken over one of the deep purple spots, black blood sometimes exudes.

These discharges from the stomach and bowels, I believe to be the effect of congestion or accumulation of blood in the vena cava and the neighbouring branches, because they almost invariably occur, as far as my experience extends, when the pulse is weak, and are often great when the temperature of the surface is reduced and the patient is pale; which indicate weakened action of the heart and consequently accumulation of blood in the vena cava, &c. It is believed that they proceed from the liver, because the blood is just such as is contained in that viscus; because the secretory vessels of the liver are naturally larger than those of any other gland, as is shown by the free communication between the bile-ducts and the vena portæ by injection; because the secretory vessels of the liver, being veins, are more easily dilatable than those of the glands on the surface of the stomach and bowels, and therefore more readily suffer the blood to pass; and because when black blood is passing, there is little or no discharge of the common kinds from the bile-ducts, and when the common bilious discharges return, or are restored, the discharge of blood alone ceases.

Under this conviction I determined near seven years ago to try the efficacy of such cathartics as those above mentioned, in hæmorrhages from the stomach and bowels; and such has been the result that I rely with entire confidence on the use of these medicines alone, in all such cases.

I have a minute of one case cured by cathartics in 1822. During the autumnal epidemic of 1823, I hadseveral cases in which there was a discharge of black blood from the bowels, with purple spots on the skin of different sizes and shapes, some as small as a grain of wheat and others nearly as large as a dollar. In these cases the cathartic pills above mentioned were given so as to operate on the bowels, without any other medicine whatever, with the best effect. One of these cases only terminated in death: a child had been passing blood profusely for a week when I visited it, and was almost gone; the purple spots were some of them as large as a dollar. No effort was made to save it, as the attendants had despaired of its living.

In every autumnal season since 1823, excepting that of 1827 which was remarkably cool and healthy, similar cases have occurred in my practice; and whether the hæmorrhage appeared before any medicine was administered, which was generally the case, or during the administration of mercurial cathartics, these medicines alone were administered as being the best means of reducing that congestion or accumulation in the vena cava and its branches, of which the hæmorrhage is the effect.

The only exception to this was the employment of a blistering plaister in one case, which produced no visible effect. The result on the whole is as follows. Not taking into consideration the child above mentioned, for whom nothing was done, in every instance the hæmorrhage disappeared while taking the medicine. Four of these patients however, died, notwithstanding. A woman with such discharges from the bowels, took cathartics to a considerable extent, but without the slightest effect in producing proper discharges; she and her sister were both ill at the same time, in the same room; the sister had no hæmorrhage; cathartics had not the desired effect on the bowels of either; but during the time in which they were daily administered, the hæmorrhage lessened and disappeared, so as to bring the cases to a nearer resemblance than at first. As the cathartics had no effect in either case, I predicted to my friend Dr. Stribling, of Frederick county, Virginia, who visited them with me on the fourth day, the death of both, resting solely on the single circumstance of there

being no operation whatever. They were at that time able to rise and sit up in bed, or to get out of bed without help. They both died within four days, without having had a single bilious discharge.

In three other cases hæmorrhage appeared in the course of the treatment. The cathartics were continued notwithstanding and the discharge of blood ceased in all of them; and the patients died some time afterwards, through gross neglect of directions, one of them by excessive eating during convalescence. Some of the cases in which the patients recovered were very remarkable. A young woman about twenty years of age had the autumnal fever about the last of July and first of August 1824. While recovering slowly, in consequence of unwillingness to take sufficient medicine, she was affected with an unusual tremor of the hands. On the 6th of August she had a discharge of dark blood from the nose and mouth. After spitting out the blood as completely as possible, it could be seen to flow into the mouth and moisten the whole surface, precisely as the saliva does. She took two cathartic powders. On the second day I found the medicine had had little or no effect on the bowels; the hæmorrhage had increased; a number of irregular purple spots of different sizes had appeared on her face and neck. She was very cold and pale. A blistering plaister was applied to the back of the neck. She took in the day and night four large cathartic powders. On the third day I found the medicine had operated but slightly. The hæmorrhage from the nose and mouth continued, but was not as free as it had been: the discharges from the bowels were entirely of blood, black and fluid. She was in a cold sweat, with a low pulse. During the day and night she took more than a drachm of scammony and more than two drachms of jalap and as much aloes, made into fifty-two pills.

On the fourth day I found that she had vomited twice in the night, and in the morning had had a very offensive passage, mixed with blood. She was still cold, pale, bathed in sweat, with a weak pulse, and lay on a very hot day wrapped in a very large thick blanket. I left for her forty-eight pills, of aloes, rhubarb, and scammony, of each four scruples; four to be taken every

hour. A small blistering plaister was applied to each leg. In this situation I was compelled to leave her all day; but she was nursed by ladies on whom I could completely rely for strict attention to the directions. On arriving at the house in the evening almost afraid to inquire about her, I was greatly relieved by finding her much better. The medicine had operated well four times; the passages were of a dark colour with little or no blood. She had discharged no blood from the mouth since morning; the skin had become warm and dry. The blistering plaisters had drawn indifferently on one leg and well on the other. It may be observed that she had a blistering plaister on the second day also, but the hæmorrhage continued. The medicine had not operated; on this day it had operated well, and the hæmorrhage ceased. This moreover was the only case in which blistering was employed in the last seven seasons. Twenty-eight pills of the same kind were left to be taken in the night.

On the fifth day I found the operation had been free; the passages not so dark. She looked much better. She took in the course of the day twenty-four pills of the same kind. She continued to take the cathartic medicines every day, in sufficient quantity to operate well, and in eleven days she recovered. She took no other medicine. During the last ten days she was once bled. This was the only case in which the patient was blistered, and it was done in order to avoid blame if she should die, as was expected, and not from any belief of the value of the remedy. From all my experience I was persuaded that she would recover if dark and copious passages could be procured; and that without them she would die.

A young man who had the fever in 1824, while using mercurial cathartics with the usual effect of discharging bilious matter, with evident advantage, began to pass black blood in considerable quantity. His family was alarmed and requested me to visit him. When I arrived his physician was about giving him an opiate with a view to check the discharge. He was strongly urged to go on with his first plan, of evacuating: he did so, and the patient recovered without difficulty, and his health was unusually good for some time after.

Uterine hæmorrhage is not an uncommon occurrence in severe autumnal epidemics. In women not pregnant it is most apt to occur if the attack of fever be within a few days after the periodical discharge has ceased. In them it is no disadvantage. In pregnant women there is such a disposition to hæmorrhage in epidemic seasons, that abortion is a common occurrence in severe attacks.

There ought to be no hesitation in administering the cathartic medicines above mentioned, in consequence of these hæmorrhages. I had long ago ascertained that there is nothing in the state of pregnancy to render cathartics improper. In 1819 I was called to see a lady said to have been in labour three days. I found her suffering very severe pain in the abdomen with considerable intervals of ease. The pain was accompanied by severe straining, and the head of the child was in consequence forced down pretty low, but the os tincæ was not at all dilated. The pain was about the middle of the abdomen, and the straining was accompanied by an expression of uneasiness in the countenance, such as is produced by a griping. I judged the affection to be a bilious colic, and gave her a large dose of calomel, which operated well, discharged deep green bile and entirely relieved her for several hours. The mercurial cathartics were actively employed for three days, when she was perfectly relieved and dismissed her midwife. In a few days afterwards, however, she was delivered after a very short labour from which she recovered well.

This has long been my practice in pregnant women requiring the use of cathartics: and when it was ascertained that these medicines are the best that can be given in hæmorrhages, it was concluded that in the hæmorrhages of pregnant women they must be equally beneficial. In the space allotted to this essay there is not room to enlarge on this subject. In the work above referred to, ample evidence is offered of the perfect safety of cathartics in these cases, and the great benefit to be derived from them.* Suffice it here to say that active cathartics, such as are above described, are effectual in removing uterine hæmorrhages, whe-

* Pathology and Therapeutics, paragraphs 2127. 2169.

ther in the impregnated or the unimpregnated state, whether the patient have fever or not. For near seven years I have given nothing else, and have uniformly found them successful in a very remarkable degree.

The difficulties frequently in the way of effecting the great object in all autumnal fevers, a free evacuation from the biliary ducts, are now to be mentioned. These are a great disposition to serous discharges from the bowels, sometimes without the administration of medicine, and sometimes in consequence of it; difficulty of operating upon the bowels, apparently arising from insensibility to the action of medicines; and extreme irritability of the stomach, in consequence of which almost every medicine is rejected as soon as swallowed.

The disposition to serous discharges is readily overcome by the use of calomel and aloes, or calomel alone. By the addition of aloes less calomel is required to effect the purpose, or it is effected in a shorter time. The combination is usually given in the form of a pill; in consequence of which it is sometimes rejected by the stomach. This may often be remedied by administering it in the form of a powder, which, as the dose is small, may be taken in jelly or any thing of similar consistence; not mixing it, on account of the nauseous taste, but laying the powder on a small portion of jelly, and covering it with another. If this be rejected, the dependance is on calomel alone, and it is one that will not fail. Ten grains of calomel with or without aloes, two, three or four times a-day according to the urgency of the case, will in a day or two produce a marked effect on the discharges: they will become darker and more consistent. There is almost no danger of exciting ptyalism during the continuance of the thin discharges, and therefore there ought to be no hesitation in administering the calomel until dark and consistent discharges are obtained. If the case is urgent, from a scruple to a drachm should be given at once, in order to obtain the desired effect as speedily as possible, and repeated according to the necessity of the case. I have known physicians who would not hesitate to give a patient ten grains three or four times a day for one or more days, but were unwilling to give more than ten, and under any circumstances would

not consent to give more than a scruple, at once. It is obvious, however, that half a drachm given at one dose will not have any more effect in exciting ptyalism, than if it be given in three doses in the course of the day: it will moreover have a better opportunity of producing its cathartic effect, when given at once than in several portions at different times. If therefore it be ascertained by trial, that the patient requires three doses a-day to produce discharges from the biliary ducts, it is at least as safe to give the whole at once.

I visited a patient, about thirteen years of age, in consultation with a neighbouring physician, who had abundant watery passages. He had taken a scruple of calomel with a little ipecacuana, and a dose of calomel alone before his physician was called in. I urged the continuance of the latter without addition. He took a seruple three times a-day for two days. No alteration having taken place, which was very unusual, a change of the medicine was strongly urged; and the physician and the mother insisted that no such change of the appearance of the discharges as was anticipated, would ever take place. The calomel however was given that night, and next morning the discharges were consistent, green, and copious. It was so managed notwithstanding, before I visited him, as to reduce the morning dose to half the quantity, and by the middle of the day the discharges had again become watery. The plan of treatment once broken into, was not resumed, and, as I predicted at the moment, he died, in about thirty hours.

This was in very hot weather. Soon afterwards a girl of nine years of age was attacked in a similar manner, and became a patient of mine. She took immediately half a scruple of calomel and repeated it every hour until the discharges became black and consistent. She took five doses: so considerable a quantity of calomel was given under apprehensions of a result similar to the preceding one; and the day after the discharges became black and consistent, a mixture of rhubarb and calcined magnesia, of each ten grains, was substituted for the calomel, in hopes it would answer the purpose of keeping them up. It succeeded very well, and she took two more such doses in the following days, and speedily recovered.

Children take pills badly, and therefore it is difficult to give them aloes, which cannot well be given in any other form on account of the taste. I have very rarely used magnesia, even in the small quantity above mentioned, in such cases. In general rhubarb alone has been preferred when the quantity of calomel previously used has been considerable; if not, rhubarb and calomel. Sometimes I have however, found it necessary to give them aloes in powder with the rhubarb; and would *always* prefer giving that medicine when the calomel is omitted, if they can take pills.

With regard to patients in general, as soon as the evacuations become consistent, and are not followed by thin discharges in the after-part of the day, the pills of aloes, rhubarb and calomel may be used instead of the latter alone. If the discharges again become thin, the rhubarb should be left out. If after a few days this prescription is found to be not sufficiently active in the common dose, and the patient be unwilling to take a larger one, it will be necessary to substitute jalap or scammony for the rhubarb: the former however is preferable. If the patient prefer the latter, as he advances to a healthy state it will often be found too active, and he should return to the rhubarb and aloes, with or without calomel according to circumstances. These medicines being continued so as to produce two copious consistent passages every day, the patient will rapidly recover without any other medicine.

Cases sometimes occur in which the bowels discover great insensibility to the action of such medicines as are best adapted to produce discharges from the biliary ducts. In every epidemic we occasionally meet with them; and the difficulty thence arising, forms a principal feature of some epidemics.

Simple difficulty of operating on the bowels can, perhaps in every instance, be overcome: but it sometimes requires very strenuous and persevering efforts. In such cases the patient should, as soon as his situation is discovered, lose blood if the pulse admit of it, take a full dose of calomel, and every hour or two afterwards half a dozen pills of aloes and jalap or scammony. The more the patient can take the better, for this reason; that the extent of the difficulty is not known, and, the patient being in danger, it cannot be determined what is to be the result to

him, until an operation is effected. In such a case, the patient a near relative, of great importance to his connexions, taken very ill in an epidemic season of which the difficulty in question was the principal feature, was bled and took a dozen pills at once, of aloes, jalap and calomel: finding next morning, that the medicine had not operated, it was evident no time was to be lost. He took twelve pills every hour until he had taken sixty, when they operated copiously several times. The difficulty continued great throughout and the quantity of medicine necessary to operate, gradually declined, in ten days, to two dozen pills in the day: and for three weeks afterwards he averaged two dozen a-day. It is obvious in this case, which ended well, that if the patient had commenced with what might be considered in common a full dose of the pills, and had repeated it even twice in the day, that days would have elapsed before the quantity found necessary to operate, could have been taken. Further, that the six dozen pills it was found, on trial, necessary to operate, would not have acted if given in smaller doses and at longer intervals. The common rate of administering would therefore, in all human probability, have failed to save this patient.

This plan is effectual and safe. It is safe, because if the case turn out less obstinate than was feared, as soon as the difficulty is overcome, we can stop without any apprehension of an excessive and exhausting discharge, as readily occurs from the use of those medicines which produce watery passages; and if it prove very obstinate, we have lost no time, but are exerting ourselves in a way that is almost sure to succeed. Indeed I have never known it fail.

In a series of epidemics from 1822 to 1826 inclusive, fruitful of these cases, this prescription never failed when the medicine was retained. It sometimes however, requires considerable resolution to persevere, as the following case shows. A gentleman in 1826, very ill, was attended by my friend Dr. McGuire of Winchester, Virginia, who, aware of this feature of the prevailing epidemic, commenced very actively. The medicine, however, failed entirely. His great anxiety for his friend induced him to request me to visit him. We agreed entirely and gave him vari-

ous medicines in great quantity, for three days without effect. Some idea may be formed of the difficulty by the fact that he took in one night five drachms of scammony. On the fifth morning, some of the friends under great alarm, urged the use of milder medicines. Too much had been already yielded, and time had been lost in trying every thing that was thought likely to effect the object. Magnesia and rhubarb, oil and infusion of senna had passed unchanged through his bowels. We therefore agreed to tell the patient that nothing but a determined effort on his part to swallow whatever was given him, offered any prospect of safety. He commenced without delay and took six *pills of* aloes scammony and rhubarb, ten grains of each, every hour, night and day. On the third day the medicine operated and *the* discharges were bilious. In this time he took a dose or two of calomel in addition to the pills. The necessity of continuing *the* medicine did not cease; but the quantity necessary to operate gradually declined, until in a fortnight two or three pills produced as much effect as ten or twelve dozen had at a former period. He recovered perfectly in a short time.

In the course of the autumnal season of 1826, so many cases of this kind occurred as to stimulate every one engaged in the practice to the utmost exertion of his faculties, in order to accomplish that which all admitted to be essential, bilious evacuations. Every cathartic medicine and various combinations were tried. It is certain that those who relied on saline medicines and infusion of senna, &c. were particularly unfortunate *in the* termination of their cases. Oil passed unaltered. Infusion of senna did the same. Rhubarb and calcined magnesia passed off with the precise appearance that would be observed on mixing water and those medicines together, viz. a watery red *fluid with* a white sediment. Gamboge and calomel purged the patient excessively and produced alarming exhaustion. Jalap *alone* succeeded when the patient could retain it in large quantities. In two cases in the preceding year it passed through *the bowels* unaltered. The conviction of the sure dependance to be placed in the pills of aloes with jalap or scammony, was the result of experience gained in 1826 and subsequently, and they were not

relied on in these two cases, although they were used among other medicines. Jalap was the medicine relied on, and failed, as above mentioned, entirely and the patients both died. Scammony succeeded in the cases in which it was relied on entirely, if the patient could retain it; but it was not used often enough to decide the point, whether it would not sometimes pass unaltered. The pills themselves were sometimes seen among the discharges; but that is the case when they succeed very well. They have never been known as others above mentioned to pass off alone; but have eventually succeeded in producing bilious discharges in every case in which they were retained.

The third difficulty mentioned as frequently encountered in the treatment of autumnal diseases, is irritability of the stomach, in consequence of which most medicines are rejected and have no opportunity of operating on the bowels. In some cases there are incessant and violent efforts to vomit for days together, or even until death. Indeed death is inevitable in this situation if a free discharge of bilious matter cannot be effected, or does not spontaneously occur; and when this is abundant, the relief is most remarkable.

When this state of the stomach discovers itself by the rejection of the pills of aloes, rhubarb and calomel, or by frequent efforts to vomit, it is best to take an effectual step at once. The patient should take without delay a large dose of scammony and calomel, or calomel alone if the former be not at hand, (which however ought not to be, when lives are placed in our hands). It is better to do that at first which will in all probability become necessary at last, with the disadvantage of an increase of the disdisease and apprehensions from a number of small and ineffectual doses retained. This is a step I never have yet repented taking. It is one I never knew do harm, and it scarcely ever fails to do good. As soon as an effectual operation is established, the irritability is, for the most part, gone, and the case proceeds as others do, sometimes moderate doses succeeding very well, at others large doses being required for a considerable time. This is best exemplified by cases.

I was called to see a patient who had been making efforts to

vomit for more than four days: as frequently occurs in these cases nothing was thrown up. She had had no passage from the bowels. She was bled and took immediately a scruple of calomel and every two hours afterwards, ten grains of scammony, drinking *very hot* water alone after the medicine. This operated in some hours, the vomiting ceased and the case proceeded as usual. This was a case in which nothing had been given, and there was no reason from any circumstances to apprehend an obstinate state of the bowels. In other cases, from previous fruitless efforts to move the bowels, or from a knowledge of the character of the prevailing epidemic, we infer that more active steps are *necessary.*

In a case in which the stomach was very irritable, and for several days efforts had been made to move the bowels in vain, the patient took a drachm of scammony and as much calomel at once, in powder mixed with sugar and water, (which was preferred to syrup because the latter would form with it a more adhesive mass, whereby the stomach would have more power over it, to reject it); and was directed to drink *very hot* water after it for some time. It operated once or twice in about twelve hours and produced such discharges as were desired. It was followed by scammony and aloes in pills given repeatedly during the day: at night, the stomach being still irritable and retaining with difficulty an insufficient quantity of the pills, the same dose of scammony and calomel, one drachm of each, was given. In twelve hours it operated well several times, the stomach retained without difficulty a sufficient quantity of scammony and aloes to operate freely, and this medicine alone being continued day by day, the patient perfectly and speedily recovered.

Sometimes scammony and calomel is rejected by the stomach, and then the dependance is on calomel alone. This however is not often the case: in the autumnal season of 1826 (a season so remarkable, in Winchester Virginia, for every kind of difficulty in the treatment of the epidemic fever, that a good history of it would constitute a most interesting paper), that combination was found superior to any other, except perhaps the compound extract of colocynth and calomel; and this extract (it will be remembered) is from colocynth, aloes and scammony.

When it is found necessary to rely on calomel alone, it is to be remembered that the patient's life is staked on the issue. Time should not be lost in insignificant efforts: every dose fruitlessly administered renders the situation of the patient more alarming, because it is propelling him towards ptyalism (the only bar to the administration of this medicine in sufficient quantity to cure every autumnal fever); and thereby cramps the subsequent efforts of the physician, through fear of the consequences. As much therefore should be given at once as it is reasonable to believe will succeed; and a judgment should be formed from what has already been done and from the character of the epidemic. I have in these circumstances given with the best effect a drachm of calomel. It produces a copious, tenacious or viscid discharge, of a deep green or nearly black colour, and affords the most marked relief: in short, it produces the same effect in these desperate cases that a common dose produces in a common case. It very frequently happens however that a physician will not venture, as he terms it, to give so large a dose; but will not hesitate much to give ten grains every two or three hours until the patient has taken as much. It is however most evident that by this procedure the risk is incurred without obtaining the full benefit of the cathartic operation. It is also to be observed that such practitioners will not hesitate to persist for days in repeating small doses, until they far exceed the quantity which, given at once, would have completely succeeded; for it is to be remembered that one or two large doses, often so completely remove the irritable state of the stomach, that the case may afterwards be managed without calomel, aloes being substituted for it in combination with jalap, &c.

It is exceedingly rare to find a patient require more than a dose or two of the size above mentioned to effect the object in view. It sometimes, however, fails. In the autumnal season of 1826, a robust young woman, sixteen years of age, was suddenly and violently attacked. Being called immediately, I found her with an uncommonly dark bilious and anxious countenance, great soreness of the epigastrium and excessive irritability of the stomach. After several fruitless trials to operate on the bowels, the medi-

cine having been thrown up, she took a drachm of calomel: as this did not operate in some hours she took another, and repeated the dose until in the course of the twenty-four hours she had taken four. These had a most excellent effect, and I considered her safe. The next day however, as she had taken a larger quantity of calomel than I had ever given in a day, and as the discharges had been very consistent and black, she took jalap and crem. tartar all day: it had however not the least effect, and at night she began to vomit and threw it all up. She then took a drachm of calomel and repeated it until she had taken five in the course of the night and morning, with the same fine effect in producing abundant bilious discharges, and with remarkably good effect on the symptoms generally. Still more uneasy from apprehensions of ptyalism, I gave her on the following day crem. tartar alone. I was led to this by some experience of its remaining better on the stomach than most medicines, and was less afraid of its producing watery passages in consequence of the extreme viscidity of those of the day before. She took it all day as before, and at night commenced vomiting and threw it all up. My fears of the consequence of continuing to give the only medicine which offered any prospect of saving her, held my hand; and she continued to vomit until death relieved her. I reproached myself on her account afterwards, and felt conscious that fear of a remote and uncertain evil had induced me to stand and see her die, *without doing* for her all I might have done. I was convinced she would not have died, had the calomel been continued; and *subsequent* experience in my own practice and that of my friends, has confirmed the conviction.

A girl of much the same robust habit was attacked in a very similar manner. She had excessive soreness of the epigastrium and hypochondria, incessant disposition to vomit, and threw up every thing that was taken into the stomach. She was the patient of my friend John P. Spindle M. D. now of Tennessee. He made great efforts for five days to operate on the bowels, but without any good effect, except on the fifth day, when he gave her four doses of calomel, containing above three drachms. This produced copious, dark and bilious passages. Next day, fearful

of the consequences, he gave her sundry medicines without calomel, and varied them in every possible way for three days, without the least success. He then desired me to visit her. She was lying on her back and could not turn on her side on account of the soreness across the epigastrium, and vomited every thing she swallowed. Being of very full and vigorous habit of body, having had no operation on the bowels for nine days, except on the fifth, and having symptoms of a very high grade of autumnal fever, it required no prophetic spirit to tell that she would die if not relieved. Nine days trial clearly showed that it would be folly to persist in efforts with any thing but calomel. The result of the fifth day's efforts made it evident that common doses would not succeed: above three drachms had been given before any good effect was produced: to give less, would be to give what must certainly be repeated in order to succeed, and to give *any* was folly if we were not determined to succeed. We therefore, after bleeding her, which the state of the pulse still admitted, gave four drachms at once. At night, eight or ten hours afterwards, the medicine not having operated, the dose was repeated: Next day she discharged at least two gallons of thick bilious matter. We gave her no more medicine, but a continued discharge, in sufficient quantity, was kept up from the bowels by the use of the juice of a species of cherry which was very laxative, and strong rose-leaf tea. She recovered perfectly in a few weeks, and is now well.

It cannot be questioned that this practice would be followed, but for the fear of the injurious effects on the mouth. But is the bare *apprehension* of the most dreadful salivation more terrible than certain death? Surely not. I have never yet met with a family, who did not urge the use of the calomel, when the case was plainly stated to them (as has been my practice in the very few cases in which such treatment was necessary); nor a patient who would not rather run the risk than die. The son of a friend of mine was very ill. Many trials plainly showed that nothing but calomel would remain on his stomach, excepting only croton oil which among other remedies was tried in 1826: of this medicine he took a whole bottle in a few days with partial effect. When this was all used and no more to be had in time, his case

was stated to his father. He was told, what indeed he fully apprehended with all that saw the boy, that he could not live unless an operation could be effected, and that in effecting this by the sole medicine that could do it, there was a risk of producing terrible mischief. He urged me to make every effort and *run the risk.* The boy naturally thin and delicate, was by this time very much emaciated. He took too scruples of calomel, which it was known from the effect of previous medicines and the general character of the epidemic, was not more than enough to operate. It produced two passages. The same dose was continued for seventeen days, except that on one day he took a drachm. There were two or three passages daily, consistent and bilious. He recovered and was unusually fat and hearty afterwards.

The risk of salivation in these extreme cases is less than is supposed. I have never known a patient in the circumstances above stated as absolutely requiring some energetic mode of procedure, to be badly salivated after taking the largest dose. The patient first mentioned, who died, had not the slightest degree of affection of the mouth. The second had a small mercurial ulcer on the inside of the cheek when I first saw her: this was considerably increased afterwards, but soon healed by the frequent application of a weak solution of the sulphate of copper in water, which is the most effectual application I have ever met with. The boy had also a small ulcer in the same place: the same was gently applied to it with a soft mop frequently in the day, and it did not increase. The worst case of ptyalism that ever occurred in my practice (I mean in cases in which I had the entire control of the patient) occurred in the year 1816. The patient, with irritable stomach and bowels almost immoveable, took calomel with other medicines in common doses frequently repeated for a week, without producing any evacuation. She took in the week about an ounce of calomel. She recovered and suffered no lasting inconvenience however. I am now entirely persuaded that a fourth of the quantity given on the first day would have operated well and would not have salivated her.

If a person in an ordinary attack take a very large dose it will very likely salivate; but in the circumstances mentioned,

the same cause which renders the system less sensible to the action of mercury in one part, renders it less so in the other; so that if it take an uncommon dose to operate on the bowels, it takes more than common to act on the mouth. I have even known salivation cured by purging with calomel alone. Miss W. in Winchester Virginia was a patient of my friend Dr. M'Guire. Being extremely ill, a consultation was desired and the doctor requested me to visit her. She had been taking medicines for several days but had thrown up every thing, so that calomel had been for a day or two the whole dependance. She had taken as much as half a drachm in the day, but had had no operation from any thing. She was pale, the pupils were dilated, she was restless and a little delirious, her stomach rejected every thing, even water; she had also a sore mouth, and the saliva was abundant. Our views agreed perfectly: we were persuaded that she would speedily die unless soon relieved by free evacuations from the biliary ducts, that she could not bear the loss of any blood to aid the operation, that no medicine could be retained for a moment but calomel, that what had been given was not sufficient, for the best of reasons, it had not operated, and therefore, that she must take larger doses or die; and although, to take larger doses while her mouth was sore, appeared to be a hazardous measure, we concluded it was the only course, and we must risk our reputation for her benefit as she reposed her confidence in us. Accordingly we gave her a drachm; it operated well, the discharges were of a deep green colour: the same dose was repeated with the same effect every day for a week, except one day when she took somewhat more; at the end of which time she could sit up and eat, and every appearance of soreness had ceased in the mouth.

I have been led to the statement of these extraordinary cases by *a sense of duty*. It has been said "thousands die of medicable wounds": thousands of thousands, I am fully persuaded, die of fevers that might be cured. I have known many perish for want of free bilious discharges, whom a small increase of the ordinary quantity of medicine would have saved. This would in all

probability have occurred in the case stated p. 373, but for the active cathartic there mentioned. If cases so violent as to require drachms of calomel to effect an operation, terminate with the same success when that operation is effected, as milder cases, how many people die for want of a proper operation who might be saved by a single drachm?

When a physician unfortunately finds himself engaged in so difficult a case, the question before him is this: is the end in view necessary to the recovery of the patient? all our experience is in the affirmative. The question next is, has the patient taken a sufficient quantity? Certainly not to operate: he must then take more; the purpose must be effected or death will follow. If a case occur in which the common cathartic produces no effect, no one hesitates to increase the dose next day. Physicians in general continue, in such cases, to make attempts day by day, with doses considerably larger than common, and repeated several times in the day; and when they succeed in their efforts, they congratulate themselves and the patient, and consider very justly that they have saved his life: but when they fail, what is the fair inference, but that the patient has lost his life because they have failed to operate upon his bowels? And why should they fail with the means of success in their hands?

I would however wish that the reader should particularly understand that it is not intended to recommend large doses of calomel or of any other medicine in common cases. On the contrary I have always endeavoured to accomplish the object in view with as small a quantity of calomel as possible; and in the great majority of cases succeed with from five to ten grains a-day. But in cases in which common means have been found to fail and the patient's life is suspended on the issue, I should hold myself criminal not to give such does as, from all the circumstances of previous failure and the general character of the epidemic, in my best judgment I believe will succeed.

It is further to be particularly remembered that of the desperate cases under consideration, no one has terminated unfavorably in which the medicine has been given to the extent of operating on the bowels and sustaining that operation; that every case has

terminated in death in which this was not done: and that in no case of the kind, has salivation occurred, equal to what is frequently produced by smaller doses frequently repeated, and not operating well.

It will be observed that salivation is spoken of in this essay as an evil to be avoided. Many consider a patient safe as soon as this affection of the mouth appears. This opinion is however erroneous. The safety of the patient depends, not on producing ptyalism, but upon daily evacuations of consistent bilious matter. Without the latter, in cases of any violence, the patient will die even in a state of salivation; having them he will get well without it. In those cases in which calomel alone, or even a larger proportion of that medicine is necessary to procure the proper evacuations, the appearance of salivation is to be dreaded as a serious obstacle in the way. If the difficulty in moving the bowels should not give way when it appears, the patient's situation is a very dangerous one. In the cases stated p. 395, 397, if the affection of the mouth had increased to such a degree as to prevent the continued administration of the calomel, the patients must have died.

Some attempts have lately been made to show that means much milder than even the common mercurial practice of the country are all-sufficient in the treatment of our autumnal fevers. This doctrine may safely be left to the test of experience. It can only influence the minds of young men commencing practice, and it is very certain that the experience of a single epidemic in the South and Southwest will show them its total unsoundness.

Blistering plaisters are by some practitioners very commonly used to excite the system when the pulse is weak and the patient's extremities are frequently cold. This is entirely unnecessary. The application of hot cloths and the administration of the mercurial cathartic at the approach of the cold state or as soon as it is perceived, are sufficient to carry it off in almost every case in which a blistering plaister can be of service. I have often administered in extreme cases of this kind a large dose of calomel with the effect of raising the pulse and rendering the skin warm and soft. Visiting a patient with two physicians in consul-

tation, we found him with cold surface, marbled with livid spots and with dim vision: my friends seemed to think his case hopeless; they had found extreme difficulty in operating on his bowels throughout the treatment, and the scanty passages were black: they were advised as the best means of rousing him to give him a drachm of calomel: this was done, and in a very short time the improvement in every symptom was so striking as entirely to satisfy them, although they were startled at the proposition when first made. No other remedy whatever was employed to rouse him.

Blistering plaisters are frequently applied to the back of the neck to relieve a pain in the head. This symptom depends on the accumulation of blood in the vessels of the head, and is often most severe when the pulse is weakest; in which case it is obvious that the accumulation of blood in the vena cava extends to the veins of the head. Evacuations from the biliary ducts therefore, are the best means of relieving and will be found effectual, and without them blistering will not avail; or if the pain is removed, it is but for a few hours.

Tonics are thought by many to be indispensible in the treatment of autumnal fever. He however who tries the plan of using such cathartics as produce consistent evacuations from the bowels daily until the discharges become natural in colour &c. will be convinced that tonics are utterly unnecessary. With the return of the secretion of the liver to a healthy state, that of the glands of the stomach is abundant; the patient's appetite is sharp, and he rapidly recovers his strength. I have not given a tonic of any kind in any stage of remittent fever for more than ten years.

In the treatment of the other forms of autumnal fever, inasmuch as they are all the effect of the same cause, accumulation of blood in the vena cava and its branches, the same object should be kept steadily in view, viz. lessening that accumulation by evacuations from the biliary ducts.

The treatment of intermittent fever, is precisely the same with that of remittents, excepting only that in the former, attention is required to put an end to the chills. The only peculiarity in the treatment of intermittents consists in an endeavour to prevent the ac-

tion of the heart from sinking into the low state preceding every exacerbation, and the consequent accumulation of blood in the vena cava and its branches. It is evident that when thus accumulated within and crowding on the heart, the blood, the natural stimulus of that organ, is presented to it in unusual quantity, and the hot must necessarily follow the cold stage, if the heart be capable of increased action. The violence of this finally subsides, and the blood, lately filling the arteries and the veins of the surface, retires to the interior veins and again accumulates there, as in the first cold fit. If the accumulation within be prevented from increasing to its utmost degree; if the blood while accumulating, can be sent forward, so as to prevent the degree of fulness of the vena cava &c. existing in the cold stage, that stage is moderated or prevented, and with it the following exacerbation is also moderated. This has been effected in various ways, for the most part empirically. Among the vast number of popular remedies for intermittent fever, perhaps every successful one acts in this way. Such are running, walking or riding a short time before the access of the cold fit, stewed drams at the same period of the disease, and a great variety of others, the effect of which is obviously to promote the diffusion of the blood towards the surface. Among medical men the same is usually effected by emetics, by bark, by laudanum or opium, and in obstinate cases by a salivation. The former are administered a little before the access of the cold fit, and the effect of each is obviously to promote the action of the heart, whereby the accumulation in a very great degree, and consequently the accompanying symptoms, are prevented. Salivating acts in the same way. The mercurial action is remarkably uniform and durable, and the action of the heart, while under its influence, in general is not allowed to sink down into the low state observed in the cold fit.

Seeing then that the object to be effected in the treatment of intermittent fevers, is to support the action of the heart when low, and reduce it when high, as well as to evacuate through the liver from the vena cava &c., it some years ago occurred to me that the pills before mentioned as effectual for the latter purpose, being composed of stimulant cathartic medicines, which often excite the

system considerably, would answer for the former purposes also, that by giving them after the fever, two hours before the next cold fit was expected, they would by exciting the action of the heart, tend directly to prevent the accumulation of blood in the interior veins, and that by the time the fever began to rise, the evacuations produced by them would contribute to keep it down. This idea has been fully tested and the practice founded on it, has been completely successful.

During the great epidemic of 1823, in which clearly marked tertians with most severe agues, were very common in the country around Winchester in Virginia, this method failed in only two cases; in neither of which a fair trial was made. In one the ague was removed, but the patient ceasing to take the medicine while the discharges from the bowels were still black, it returned as was predicted. In the other, the ague being violent and the case having occurred before the good effect of the mode of treatment was so manifest as it afterwards was, opium and camphor, in doses of two grains of the former and five of the latter, were substituted for the pills. Five such doses were taken in five days, before the recurrence of the ague was prevented.

In subsequent years similar success has followed the administration of this medicine in this way, insomuch that no other remedy has been employed in my practice, except in a case of extreme violence, in which the agitations of the body were so extraordinary that it was deemed proper to prevent if possible another fit, which was done with the saturated solution of arsenic; a medicine which I had used for twenty years with almost invariable success, when the plan of treatment above described was adopted. Five drops of the saturated solution to an adult is the proper dose in most cases, to be repeated three times in the twenty-four hours immediately preceding the period of the expected chill or ague, and the last dose but a short time before it. Two or three drops are enough for feeble and reduced persons. A large dose purges and sometimes vomits. The superiority of the mode of curing by cathartics consists in this, that the cause of the symptoms, accumulation of blood in the vena cava &c. is removed, and with it those effects of that fulness, enlarged vis-

ra, œdematous swellings, &c. which, when bark, quinine or arsenic is used, sometimes remain.

After the recurrence of the ague or chill is prevented, the disease is not to be distinguished from a remittent fever: it is a remittent and is to be treated as above stated.

Dysentery is another form of autumnal fever, to be treated in every point as such a fever. After bleeding when the pulse admits of it, the continued administration of mercurial cathartics in such manner as to produce free discharges from the biliary ducts, as far as my experience extends, never fails to remove the disease, if continued in the manner above described in the treatment of remittent fever. The symptom which distinguishes dysenteric from other cases of autumnal fever, is removed in a day or two, in general, and the case is then not to be distinguished from any other case of autumnal fever; and is to be treated as such in every respect. The same difficulty in operating on the bowels and the same irritability of the stomach are sometimes met with in these, as in other cases of autumnal fever, and are to be overcome in the same way precisely.

A mulatto girl, twelve or thirteen years of age, had, for a whole week, taken every variety of cathartic medicine that an anxious desire for her recovery suggested, and without the least advantage. She had not in that time a single discharge from the bowels, other than the small discharges of bloody mucus from the rectum. Her groans were incessant and in the highest degree distressing: her death was considered inevitable. As her stomach retained every thing she took after the first two or three days, I determined to make a regular continued effort to operate on her bowels with large doses of jalap alone, as she had taken as much calomel as was thought safe to give her. She commenced immediately with a drachm, and took as much every hour until she had taken four drachms, when it operated: the passages were a dark green, large and very consistent. As long as the discharges continued free, she was almost entirely easy; but after three or four passages, they became small, and the pain began to return. Without delay she began again to take the same doses: there was no operation after she recommenced, until she

had taken four more drachms of jalap, when the same kind of discharges appeared as in the first instance, and continued until she had had three or four, during which time she was again easy. As they dwindled, the pain returned. She then commenced a third time and took three drachms, when the operation became free, and continued for a week moderately, and she perfectly recovered. Several cases similar to this occurred in the same year, 1816, when the dysentery was epidemic in Fauquier County, Virginia. Not one of these cases ended unfavorably, provided mercurial catharties were given in sufficient quantity to effect a free bilious discharge from the beginning. Not one ended favorably in which this was not done. I knew one instance in which the patient died under free and continued discharges produced by Epsom salts; and another in which the patient had been relieved by large doses of rhubarb and calomel, and was convalescent, but by the administration of an opiate the discharges from the bowels were arrested and the patient died in three days.

A young man had been taking a variety of cathartics without an effectual operation. He required large doses and could not retain enough of any of the ordinary medicines to operate. Infusion of senna passed through him apparently unchanged; oil did the same. He used half a pound of senna in the day for several days, besides other medicines. Two dozen pills of jalap, aloes and calomel, containing a drachm of each barely operated; but when they did, they afforded relief from the tenesmus &c. If he could have taken more of them, they would have put an end to the disease: this he could not do in consequence of the state of his stomach, which whenever they were pushed farther, rejected the whole. In this state having been ill a fortnight, he took a drachm of calomel and half a drachm of scammony which operated moderately: he next day and the day after, took a drachm of each which produced copious dark coloured passages. These were kept up day by day, with aloes and jalap, which he was now enabled to retain, and he recovered beyond the expectations of almost any that saw him.

Emetics have been highly recommended in dysentery. They

are useful in several respects, as in remittent fever, but the evacuations above described are indispensible in serious cases. Ipecacuana is perhaps the best emetic in these cases. If after operating it act on the bowels, or if it act on the bowels without vomiting, and the action be kept up, the patient will seldom fail to recover. Until the year 1816 I never met with any difficulty in the treatment of dysentery with ipecacuana alone. In the summer and fall of that year this disease was epidemic in Fauquier County Virginia; the ipecacuana could not be retained by the stomach in doses of a single grain, and I was compelled to have recourse to mercurial cathartics. The case stated p. 403 with others similar to it, occurred in that year. The ipecacuana had been laid aside some time, when I was requested to visit a negro man about twenty-five years of age. He had taken various medicines; oil, &c. &c. for several days, but without relieving him; and apprehensive of his death his master had had him carried from the house to a quarter not far off. As I rode up his groans were distinctly heard at some distance. The idea of trying the ipecacuana in this case suddenly occurring, he immediately took ten grains in a little water, and with such effect as I can never forget. In five or ten minutes he was perfectly easy. Three doses of ten grains each were left for him, with directions to take one at night, in the morning, and at noon; and if he should at any time feel more pain &c. to take one immediately. On the third day he had seventy grains of the same divided into three doses; the object being to give as much as could be retained. On the fourth day he had four doses, each twenty grains; on the fifth, six doses; on the eighth six, each twenty-five grains. After the fifth day I did not see him. The medicine operated freely every day, discharging deep green matter, and the patient recovered.

The treatment during convalescence has been already stated, in treating of the cure of remitting fever.

Cholera is another form of autumnal disease. It is needless however to go into the treatment of this disease here. It has been shown in a former paper in this journal, that the cholera of adults and the cholera infantum is the same disease. The object in view in both, as in all the forms of autumnal fever, is to procure free evacua-

tions from the biliary ducts; which being effected, the patient is greatly relieved, and by a continuation of the evacuations, cured. How this is to be effected, may be seen in the paper on cholera infantum, as well as in the cases stated p. 387 which may be considered as cholera. A single case of this disease in an adult shall be stated.

A man of thirty-five years of age called me up one morning early, in very hot weather. I found him vomiting and purging most violently: he had been all night in this situation, discharging an immense quantity of serous fluid. He was exhausted, his pulse very feeble and surface cold and pale. He took immediately a drachm of calomel; and very hot water or tea after it whenever he desired to drink. The vomiting in a short time ceased; in twelve hours the passages were green, in eighteen they were black; they were kept up next day with pills of aloes, calomel and rhubarb: on the third morning I found him sitting up at work, making shoes, though very weak. The discharges were continued, and he perfectly recovered in a remarkably short time.

I have thus given the result of my experience in all the forms of autumnal fever. It is the fruit of twenty-five years attentive observation of these diseases. Mercurial cathartics are the dependance, the indispensible remedy. Of this there is no question among the great mass of the physicians of this country, as far as it respects the treatment during the fever; but some, perhaps many, think that when the fever is gone, the patient should be supported with some kind of tonic medicine. Let the trial be made. Administer such medicines as produce free bilious evacuations from the beginning, avoiding salts, &c. which produce exhausting serous discharges, and when the patient arrives at that point at which tonics are deemed necessary, let him take aloes, rhubarb and calomel in such quantity as to produce two or three copious and consistent passages every day, and if he does not improve faster and gain a keener appetite than is usually produced by tonics, continue to use the latter.

ART. VI.—*Florula Lexingtoniensis, secundum florendi ætatem digesta; or a descriptive Catalogue of the Phænogamous plants indigenous to this portion of Kentucky; arranged in the order of their periods of flowering.* By CHARLES WILKINS SHORT, M. D. Professor of Materia Medica and Medical Botany in Transylvania University.

CONTINUED FROM PAGE 265. NO. II.

FASCICULUS II.

For April.

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23. GENUS. ACER L. *Maple.*

(*Deriv.* Latin; *acer*, sharp; pikes and lances having formerly been made of the wood.)

Class 8th. OCTANDRIA—Order, MONOGYNIA.

Gen. Ch. *Flowers* mostly polygamous. *Calyx* about 5—cleft. *Petals* 5, or none. *Samaras* 2, united at base, 1 seeded, winged.

Species 1st. ACER SACCHARINUM. *Sugar Maple.*

Sp. Ch. *Leaves* palmately 5—lobed, subcordate at base, acuminate, glaucous beneath; *peduncles* corymbose, nodding.

Obs. The Sugar tree, as it is here universally called, is one of the most common of our forest trees, and perhaps in this particular locality, it attains its greatest altitude. As it does not materially interfere with the growth of grasses beneath it, it is often reserved in clearing ground, particularly in situations intended for pasture or meadows. It here forms the densest shade, and in autumn constitutes a prominent feature in the landscape, by the bright orange and red colours assumed by its leaves. Its wood is preferred to almost any other for fuel, and large quantities of sugar are annually made from the sap. Flowers about the first of April: seed ripen in midsummer.

Species 2d. ACER NEGUNDO. *Box Elder.*

Sp. Ch. *Leaves* pinnate and ternate, unequally serrate; *flowers* dioicous.

Obs. Not so common as the preceding, being more restricted to the borders of water courses. It is in every point of view less valuable than the Sugar tree, although the sap is occasionally procured in common with that of the former, in the making of sugar. Flowers at the same time.

Species 3d. ACER DASYCARPUM. *White Maple.*

Sp. Ch. *Leaves* palmate, 5—lobed, acuminate, serrate, pubescent underneath, and almost white; *flowers* in clustered umbels; *germs* tomentose.

Obs. This tree, which in its general habit resembles the Sugar Maple, is however easily distinguished from it by the lighter and smoother colour of the bark, and the singular downy whiteness of the leaves. It attains as large a size and is valuable as fuel and for some of the mechanic arts. Sugar is also made from its sap, but it is now rarely met with in this neighbourhood.

24. GENUS. VERONICA. L. *Speedwell.*

(*Deriv.* Probably a corruption of *Vetonica*, or *Betonica*, Betony.)

Class 2d. DIANDRIA—Order, MONOGYNIA.

Gen. Ch. *Calyx* 4—parted. *Corolla* rotate, 4—lobed, unequal, the lower segment narrower. *Capsule* 2-celled, obcordate; *seeds* few.

Species 1st. VERONICA PERIGRINA. *Neckweed.*

Sp. Ch. *Flowers* solitary sessile; *leaves* oblong, rather obtuse, toothed and entire; *stem* erect.

Obs. Stem erect or partially procumbent, round, smooth, frequently without branches, 8 inches high. The lowest leaves opposite, sparsely toothed; the upper alternate, linear-lanceolate, nearly entire. Flowers axillary, solitary, nearly sessile. Corolla small, white and, like both the following, very caducous. Capsule inversely heart-shaped and larger than either of the succeeding species.—The plant has had some reputation in scrofula, hence the name of Neckweed. Flowers middle of March and after. Abundant in gardens and cultivated fields.

Species 2d. VERONICA SERPYLLIFOLIA. *Speedwell.*

Sp. Ch. *Raceme* terminal, somewhat spiked; *leaves* ovate glabrous, crenate.

Obs. A small plant common in grass lots, and scarcely distinguishable except when in bloom; stem decumbent, putting forth radicles; lower leaves roundish, ovate, smooth; flowers sky-

blue with darker stripes, larger than in the preceding species, and borne on the summit of the stem: whole plant does not exceed 6 inches in height, frequently less. Flowers from 1st of April to the last of that month, and occasionally throughout the season.

Species 3*d.* VERONICA AGRESTIS. *Germander.*

Sp. Ch. *Flowers* solitary, and with the cordate leaves nearly sessile; *stem* rough, hairy.

Obs. This species is readily distinguished from either of the preceding by its more hispid appearance, and its more diffused and branching habit. The flower is also smaller and of a deeper blue than the preceding. The leaves are mostly opposite, cordate, ovate, notched, strongly veined particularly on the lower surface, and very pubescent. Cultivated fields and pastures common: flowering rather later than the last, 5th—10th of April.

25. GENUS. CARPINUS. L.

(*Deriv.* Celtic, *Car*, wood, and *pin*, head; i. e. wood suitable for making yokes for cattle. *De Theis by Darl.*)

Class 21*st.* *MONOECIA.—Order.* *POLYANDRIA.*

Gen. Ch. MASC. Scales of the *calyx* ciliated. *Stamina* about 10. FEM. *Calyx* scales 2-flowered. *Corolla* trifid. *Nut* ovate, sulcate.

Species 1*st.* CARPINUS AMERICANA. *Iron-wood.*

Sp. Ch. *Leaves* oblong-ovate, acuminate, unequally serrate; *strobile* with 3—parted scales, the middle segment oblique, toothed on one side.

Obs. The Iron-wood, by which name this tree is here always called, is so well known as to require no description. In other portions of the union it is called Hornbeam. It is found throughout this state among other forest trees and is perhaps especially abundant in the country about Lexington, growing generally to the height of 30 or 40 feet.—The wood is possessed of great hardness and strength, but is not applied to many useful purposes. Flowers beginning of April.

Syn. C. Caroliniana. *Walt.*

26. GENUS OSTRYA. *Micheli.*

(*Deriv.* *Ostreon.* Greek, a shell or scale; from the resemblance of its capsules. *De Theis.*)

Class 21*st.* *MONOECIA. Order, POLYANDRIA.*

Gen. Ch. *Ament* imbricated. Masc. *Calyx* consisting of scales. *Filament* of the stamina ramose, Fem. *Ament* naked. *Capsules* inflated, imbricated at the base, 1-seeded.

Species 1*st.* Ostrya Virginica. *Hop-hornbeam.*

Sp. Ch. *Leaves* ovate-oblong, cordate at the base, acuminate, unequally serrate; *strobile* oblong-ovate, erect ? buds acute.

Obs. This small tree which is also called Ironwood in the Northern and Eastern States, is readily distinguished from the former by its somewhat shaggy bark and differently formed strobiles, or seed vessels: these in the present tree being so similar to those of the garden hop as to have given it the appropriate name of Hop-hornbeam. It is likewise frequent in this locality being found in company with the preceding. *Its* wood is also hard and strong; but the size of the tree being inconsiderable, it is susceptible of no very useful application. Flowers about the 1st of April.

Syn. Carpinus Ostrya *Mich.*

27. Genus. PULMONARIA. L.

(*Deriv.* *Pulmones* the lungs, from its former reputation in diseases of these organs.)

Class 5*th.* *PENTANDRIA. Order, MONOGYNIA.*

Gen. Ch. *Calyx* prismatic 5—angled, 5—toothed: *Corolla* funnel-formed, border 5—lobed; throat pervious.

Species 1*st.* Pulmonaria Virginica. *American Cowslip.*

Sp. Ch. Smooth; *stem* erect; *calyx* much shorter than the tube of the corolla; *radical leaves* ob-ovate, oblong, obtuse; *stem leaves* narrower.

Obs. This very showy plant, so common in most parts of the Union, is comparatively rare in this immediate vicinity, being only occasionally met with on the alluvion banks of Elkhorn and Kentucky river. Stem 12–15 inches high with numerous broad, smooth, spathulate leaves issuing from the root, and becoming narrower on the stem. Flowers numerous in a terminal, pendulous raceme; their colour varying from pale rose, through violet to blue. April 1st to 15th.

28. Genus. DELPHINIUM. L.

(*Deriv.* *Delphinion* of the ancient Greeks, from some fancied resemblance of its nectary, to the Dolphin. *Smith.*)

Class 12*th.* *POLYANDRIA—Order, TRIGYNIA.*

Gen. Ch. *Calyx* none. Petals 5. *Nectarium* 2—cleft, base extending into a hollow spur. *Capsules* 1—3.

Species 1*st.* Delphinium Tricorne. *Wild Larkspur.*

Sp. Ch. *Caulis* simple. *Leaves* 5—parted many-cleft with the segments linear; *raceme* straight; *nectary* shorter than the corolla; *capsules* 3, arched, expanding from the base.

Obs. The striking similarity of this plant, to the common Larkspur of the gardens at once points it out to the novice. Stem hollow, large at the base, tapering quickly to a point at the summit; rarely more than a foot high. Flowers varying in colour from dark blue to light blue, purple pink and white, are succeeded by three, horn-shaped capsules, whence the specific name. Found on creek sides, particularly preferring rocky precipices. 1st to the 10th of April.

This is one of the plants which are indefinitely called *stagger-weed;* to eating which the diseases of cattle are sometimes attributed.

29. Genus. SEDUM. L.

(Deriv. Latin *Sedere* to sit, from its growing or sitting on the surface of rocks.)

Class 10*th.* *DECANDRIA—Order, PENTAGYNIA.*

Gen. Ch. *Calyx* 5—cleft. *Petals* 5. *Capsules* 5, superior, many seeded, opening internally.

Species 1*st.* Sedum Ternatum. *Stone-crop.*

Sp. Ch. Creeping; *leaves* flat, round spathulate, by threes; *cyme* generally 3-spiked; *flowers* white.

Obs. This handsome little vegetable is apt to mislead beginners in the study of plants, from the circumstance of many of the flowers being *octandrous*, and the calyx, petals and germs being arranged by 4s instead of 5s as laid down in the generic character. The most of the species of this genus, however, are strictly decandrous, and indeed the central flower of the present species is so always. Root perennial; stem procumbent;—lower leaves orbicular; upper lanceolate; all thick and

succulent. On the shelving rocks bordering Elkhorn. Flowers beginning of April.

Syn. Sedum Portulacoides, *Muhl.*

Species 2d. SEDUM PULCHELLUM.

Sp. Ch. Glabrous, *stems* assurgent; *leaves* linear, succulent, obtuse; *cyme* many-spiked; flowers sessile.

Obs. Mainly differing from the preceding in the leaves which are linear and cylindrical. Found in company with it on moist rocks and sometimes on the trunks of decaying trees. Owing to this circumstance it is frequently mistaken for a moss by those unacquainted with its character. Flowers a little after the former.

30. GENUS. VIOLA. L. *Viola.*

(*Deriv.* A Latin name of obscure Greek derivation.)

Class 5th. PENTANDRIA—Order, MONOGYNIA.

Gen. Ch. *Calyx* 5-leaved, produced at the base. *Corolla* 5-petalled, irregular, the lower petal cornute behind. *Anthers* cohering: *Capsule* superior 3-valved, 1 celled.

Species 1st. VIOLA CUCULLATA. *Hooded Violet.*

Sp. Ch. Stemless; *leaves* cordate, somewhat acute, glabrous, hooded at base; *flowers* inverted; *petals* obliquely bent.

Obs. This is with us the most abundant of the violets, as well as the first to bloom; the whole surface of moist meadows and pastures being covered with them in the fore part of April.—Petals blue and purple, white at base; the base of upper one with violet-coloured veins; of the two lateral bearded; of the lower smooth. Peduncles longer than the leaves with the summit reflexed. Stipules linear—1st to 15th April.

Syn. Viola cordata. *Walt.*

Species 2d. VIOLA OBLIQUA. *Aiton.*

Sp. Ch. Stemless; smooth; *leaves* cordate, acute, *flat*, crenate, serrate; *flowers* obliquely bent; lateral petals bearded; inferior ones acute, carinate; *stipules* lanceolate.

Obs. This species is by no means easily distinguished from the preceding, with which it is found in common. It is, however, a larger plant, and minute examination will detect specific differences in the leaves, petioles, stipules and flowers. (See

Schweinitz's monograph on the genus Viola in American Journal of Science and Arts, Vol. 5, No. 1.)

Species 3d. VIOLA OCHROLEUCA? Schw. *White Violet.*

Sp. Ch. Caulescent. *Stem* somewhat erect, branched, purplish, smooth; *leaves* cordate, acuminate; *stipules* oblong-lanceolate, dentate-ciliate.

Obs. The present species, about which there seems some obscurity in the books to which I have referred, is easily recognized from its congeners of this locality, by its large, white flowers, with a tinge of yellow. It is found in common with the two preceding, and forms dense patches among the grass in moist situations. As the season advances it rises with a slender flexuose stem to the height of 8—12 inches, and then produces inconspicuous, apetalous flowers.

Syn. V. Striata. *Wild. Pers. Pursh. Nutt.*

Species 4th. VIOLA HASTATA. *Yellow Violet.*

Sp. Ch. Caulescent smooth; *stem* simple, leafy above; *leaves* hastate, on very long petioles; *stipules* minute, ciliate denticulate.

Obs. This, although much less frequently met with than either of the preceding, is easily distinguished from them by the deep yellow colour of its flowers. Rare in this neighbourhood, being only occasionally found in shaded woods. Flowers during the fore part of April.

Species 5th. VIOLA CONCOLOR. *Muhl.*

Sp. Ch. Caulescent. *Stem* straight erect; *leaves* cuneate-lanceolate; *stipules* lanceolate entire; *peduncles* very short, axillary, 2-3 flowered; *petals* connivent, emarginate: spur none.

Obs. This anomalous species, which appears to me very unnaturally grouped with the violets, is also very rare in this section of Kentucky. I have only met with it in a solitary, secluded, rocky spot lying to the left of, and near the Woodford road. Several stems issuing from a single root, arise erect and unbranched to the height of 1 or 2 feet, bearing lance-shaped, pointed leaves. The flowers are small and greenish-coloured, produced in 2s and 3s at the axills of the upper leaves about the 10th of April. The whole habit of the plant, however, is so unlike that of the genus, as easily to mislead the student.

Other species of this extensive tribe are no doubt to be found in the neighbourhood of Lexington: as yet however I have detected only the above. In other parts of the state six or eight additional species have been met with.

31. Genus. LEONTODON. L. *Dandelion.*

(*Deriv.* Greek *Leon* a lion and *odous* a tooth; from a fancied resemblance in the teeth of the leaves.)

Class 19th. SYNGENESIA—Order, ÆQUALIS.

Gen. Ch. *Calyx* oblong, double; outer one loose. *Receptacle* naked; *pappus* feathered.

Species 1st. Leontodon Taraxacum.

Sp. Ch. *Outer scales* of the calyx reflexed; *scapes* 1-flowered: *leaves* runcinate.

Obs. No portion of the Union is more completely overrun by this naturalized foreigner than this section, being so abundant as to give a yellowish hue to pastures in early spring (1st of April) from the profusion of its flowers.

(Specific name derived from the Greek *tarasso* to move, or trouble. from its reputed diuretic and laxative properties.)

32. Genus. POLEMONIUM. L.

(*Deriv.* According to Pliny derived from Greek, *Polemos*, war: because Kings had contended for the honor of its discovery.)

Class 5th. PENTANDRIA—Order, MONOGYNIA.

Gen. Ch. *Calyx* 5-cleft. *Corolla* somewhat rotate, 5-lobed. tube short, closed at its base by 5 staminiferous valves or scales. *Stigma* trifid. *Capsule* 3-celled, superior.

Species 1st. Polemonium Reptans. *Jacob's-ladder.*

Sp. Ch. *Leaves* pinnate, generally by sevens: *flowers* terminal nodding.

Obs. This beautiful native well deserves a place in all flower-gardens; it bears transplantation well and improves by cultivation. It is a hardy plant and, with a little protection, may be made to bloom throughout the winter. Its favorite localities are in rich shaded situations among rocks and decaying logs, where its spikes of sky-blue flowers, with white anthers, appear about the 19th of April. There is a variety with white flowers.

33. Genus. PHLOX. L. *Wild Pink.*

(*Deriv.* Greek *Phlox*, fire or flame, in allusion to the colour of the flowers.)

Class 5th. PENTANDRIA—Order, MONOGYNIA.

Gen. Ch. *Calyx* deeply 5-cleft, segments connivent. *Corolla* salver-formed; border 5-lobed, flat; tube more or less curved. *Stamina* unequal. *Capsule* subrotund, 3-celled; cells 1-seeded.

Species 1st. Phlox Divaricata? *Sweet William.*

Sp. Ch. *Stem* low, pubescent, decumbent; *leaves* oval-lanceolate; *branches* divaricate, loose, few flowered; segments of the corolla obcordate, teeth of the calyx subulate linear. *Tor.*

Obs. Of this numerous genus, there are but few natives of this locality. The present species is easily distinguished from others, by its earlier period of flowering, its lower growth, rarely rising above 1 foot, and by its partially decumbent habit. The leaves, in the specimens I have met with, have been universally opposite, sessile, and few in number. Flowers in a terminal panicle, pale blue or more frequently rose-coloured. Generally known under the name of Sweet William or May Pink. Abundant in half reclaimed lands and borders of fields, from 10th to 20th April.

34. Genus. CERASTIUM. L.

(*Deriv.* Greek *keration*, a little horn, in allusion to the shape of the capsule. *Sm.*)

Class 10th. DECANDRIA—Order, PENTAGYNIA.

Gen. Ch. *Calyx* 5-leaved. *Petals* 5, bifid or emarginate. *Capsule* 1-celled, bursting at the summit with 10 teeth.

Species 1st. Cerastium Hirsutum. *Mouse-ear Chickweed.*

Sp. Ch. Very hairy, diffuse; *leaves* oval obtuse, connate; *flowers* clustered; *petals* 2-cleft a little longer than the acute calyx. *Ell.*

Obs. Mr. Elliott's description suits this plant remarkably well as it obtains with us. Very much branched and villous. Stems rarely rising more than 6–8 inches from the ground. Flowers inconspicuous, rarely fully expanded, small, white. Common in cultivated ground; in grass land frequently assuming a yellowish colour. Flowers middle of April.

Species 2d. CERASTIUM LONGE-PEDUNCULATUM.

Sp. Ch. Viscid-pubescent; *leaves* oblong-linear, acute; *peduncles* long.

Obs. Altogether a larger plant than the preceding, rising sometimes to the height of 12 inches, but more frequently semi-procumbent. The whole plant is remarkably viscid to the touch, and is strongly characterized by the circumstance which affords the specific name, viz. the unusual length of the peduncles. Found in common with the former but much more rare. Flowers a few days later.

Syn. C. Glutinosum. *Nutt.* C. Nutans. *Torrey.*

35. GENUS. ERIGERON. *Fleabane.*

(*Deriv.* Greek *Er*, the spring, and *geron*, an old man; because it is hoary in the spring. *Sm.*)

Class 19th. SYNGENESIA—Order, SUPERFLUA.

Gen. Ch. *Calyx* imbricate. *Florets* of the ray linear, very numerous. *Pappus* double; exterior minute; interior hairy, of few rays. *Receptacle* naked.

Species 1st. ERIGERON BELLIDIFOLIUM.

Sp. Ch. Hairy, gray, *radical leaves* obovate, spathulate, subserrate: *stem leaves* remote, oblong-ovate, amplexicaul, entire; *stems* 3–5-flowered; *rays* nearly twice as long as the hemispherical calyx. *Torrey.*

Obs. The present species, as it occurs in this vicinity, differs from the foregoing description in having the lower *stem-leaves* coarsely though irregularly toothed, while the *upper ones* only are entire or untoothed. The number of flowers also exceed that mentioned in the specific description, being often as numerous as 8–10. The flowers begin to shew themselves about the 10th of April, when the plant is only 3–4 inches high, and continue unfolding, until it has attained the height of 18 or 24 inches. The central flower, as observed by Mr. Elliott, is generally larger than the lateral ones—their colour varying from delicate pink to white—in pastures and meadows abundant.

Species 2d. ERIGERON PHILADELPHICUM.

Sp. Ch. Pubescent; *leaves* cuneate-oblong, cauline semi-amplexicaul; *rays* capillary.

Obs. A much taller species than the preceding, growing 3–4 feet high, very much branched and covered with a profusion of small white or pale purple flowers, with yellow disks. This is one of the greatest pests of the farmer, frequently so completely overrunning meadows as to destroy the hay. Some repute it medicinal, attributing to it tonic and sudorific properties. Flowers later than the last, and continues in bloom much longer.

36. Genus. PHACELIA. *Jussieu.*

(*Deriv.* Greek, *Phakelos*, a bundle, from its cluster'd manner of flowering.)

Class 5th. PENTANDRIA—Order, MONOGYNIA.

Gen. Ch. Calyx 5-cleft. *Corolla* 5-cleft. *Stamens* exerted. *Capsule* 2-celled, 2-valved, 4-seeded. *Ell.*

Species 1st. Phacelia Fimbriata.

Sp. Ch. Leaves pinnatifid, the lobes undivided; segments of the *corolla* fimbriate. *Ell.*

Obs. This plant, abundant throughout the western country, has at first glance the aspect and mode of flowering of an hydrophyllum. The whole part is hispid, the lower leaves somewhat petioled, the upper sessile or amplexicaul; all alternate and pinnatifid. Flowers of a pale blue are borne in a simple terminal raceme, revolute before flowering, become erect afterwards. Calyx persistent. Style 2-cleft. Grows in clumps; outer branches semi-prostrate; central more erect, rising to the height of 10–12 inches. Moist meadows—flowers from the middle of April.

37. Genus. CERCIS. L.

(*Deriv.* Greek *kerkis* of Theophrastus.)

Class 10th. DECANDRIA—Order, MONOGYNIA.

Gen. Ch. Calyx 5-toothed, gibbous at base. *Corolla* papilionaceous, with a short vexillum under the wings. *Seed vessel* a legume.

Species 1st. Cercis Canadensis. *Red Bud.*

Sp. Ch. Leaves nearly round, cordate, acuminate, villous at the axils of the nerves, *legumes* on short foot-stalks.

Obs. The Red-bud, by which name it is universally known in this country, does not occur spontaneously in the level rich lands immediately round Lexington; but as the face of the

country becomes more broken on approaching the Kentucky river, it is met with in great abundance; constituting, by the profusion of its pale rose-colour'd flowers, a pleasing object in early spring, before any of the forest trees have put forth their leaves. It never rises, even in the best soil, to any considerable elevation, but when growing singly its branches extend horizontally to a great extent in proportion to its height. The flowers appear generally by the 12th of April and are succeeded by a great number of pods, borne on short peduncles; and the tree becomes clothed, towards the 1st of May, with large heart-shaped leaves of a rich dark green.

38. Genus. FRAXINUS. L. *Ash Tree.*

(*Deriv.* The Latin name of the Ash Tree: Etymology obscure. *Dur.*)

Class 2d. DECANDRIA—Order, MONOGYNIA.

Gen. Ch. Polygamous: *Calyx* none, or 4-parted. *Corolla* none, or 4-petalled. *Samara* 1-seeded: wing lanceolate.

Species 1st. Fraxinus Americana. *White Ash.*

Sp. Ch. *Leaflets* petiolate, oval-lanceolate, acuminate, slightly toothed, glaucous beneath.

Obs. This is one of the largest as well as the most useful of our forest trees; growing frequently to the height of 80 feet with a diameter of 3 feet; and applicable to many useful purposes in building, the mechanic arts and rural economy. It is readily distinguished from the *Blue Ash*, with which it is found in common, by its whiter, ash-coloured bark. Flowers about the middle of April, and is abundantly met with on the richer lands throughout the state.

Syn. F. Discolor, *Muhl.* F. Alba. *Marshall.* F. Acuminata. *Pursh.*

Species 2d. Fraxinus Quadrangulata. *Blue Ash.*

Sp. Ch. *Leaflets* subsessile, oval-lanceolate, serrate, pubescent underneath: younger *branches* quadrangular.

Obs. The blue ash is more limited in its geographical range than the preceding species; but in this locality it is equally abundant and attains nearly if not quite to as large a size. Its wood unites strength with durability and elasticity and hence is applicable to a great variety of uses. Flowers about the same time with the former.

Species 3d. Fraxinus Sambucifolia. *Black Ash.*

Sp. Ch. *Leaflets* sessile, oval-lanceolate, serrate, acuminate, base rounded and unequal.

Obs. This is also a large tree, but much less frequent than either of the preceding, in this neighbourhood; in the western part of the State, on the contrary, it becomes more abundant than either, and is made to supply the purposes of both. Its wood, however, being marked with black streaks makes it more unfit for flooring. It is said, moreover, to be less durable than the two species just mentioned.

39. Genus. LAURUS. L.

(*Deriv.* The ancient Latin name of the Bay tree: Origin obscure. *Darl.*)

Class 9*th.* *ENNEANDRIA—Order, MONOGYNIA.*

Gen. Ch. *Calyx* none. *Corolla* resembling a calyx, 4–6 parted. *Nectary* with 3 two-awned glands surrounding the germ. *Stamina* variable, 3 to 14. *Drupe* 1-seeded.

Species 1*st.* Laurus Benzoin. *Spicewood.*

Sp. Ch. *Leaves* obovate, lanceolate, pubescent underneath: *flowers* in clustered umbels: buds and pedicels smooth.

Obs. The Spicewood is a common shrub throughout the Union; and is here met with in all shaded, rich woods where the undergrowth has not been destroyed; preferring mostly situations near small streams of water. Its little, yellow, clustered flowers appear towards the middle of April or earlier, before any appearance of foliage is observed on the branches, and are succeeded by numerous bright red berries. The bark of the wood is pleasantly aromatic and is sometimes used in warm infusion as a diaphoretic.

Species 2*d.* Laurus Sassafras. *Sassafras.*

Sp. Ch. Mostly dioicous; *leaves* some oval and entire, others 2 or 3 lobed.

Obs. This tree, although very abundant in some portions of the state, is not met with any where within a few miles of Lexington. On approaching the Kentucky river, within the bounds of the county of Fayette, it is seen growing in fence corners, having sprung up since the clearing of the land: and on the alluvions and hills bordering that river large trees of 12–18 inches diameter are frequently seen. Flowers generally towards the middle of April, in somewhat the same manner with

the Spicewood: its fruit however is larger and of a blue colour. Popular opinion has long since attributed much virtue to the bark of the Sassafras root; and medical countenance is frequently given to the idea of its being a *purifier of the blood.*

By some botanists these two species of Laurus are thrown into a sub-genus called *Euosmus*, from their pleasant aroma.

40. Genus PHALANGIUM. *Tournefort.* *Wild Hyacinth.*

(*Deriv.* A Greek name of a plant, mentioned by Dioscorides, derived perhaps from *phalagx*, a phalanx or legion, in allusion to the number and disposition of its flowers.)

Class 6th. HEXANDRIA—Order, MONOGYNIA.

Gen. Ch. *Corolla* of six petals, spreading. *Filaments* naked or smooth. *Capsule* ovate. *Seeds* angular.

Species 1st. Phalangium Esculentum. *Nuttall.*

Sp. Ch. *Root* bulbous, *leaves* all radical, linear, carinate; *stigma* minutely 3-cleft.

Obs. This is decidedly one of the most beautiful of our indigenous plants; throwing up from the centre of a tuft of smooth grass-like leaves, a long solitary stem 1 to 2 feet high, sheathed below by a few convoluted bractes, and clothed at the summit by a number of large purple or pale-blue flowers, 10 or 12 of which are in perfection at a time; these slowly shrivelling, (marcescent,) others are evolved, so as to keep up a succession of bloom for several days. The root, which is bulbous and situated deep in the ground, is eatable and nutritious—Frequent in moist meadows in certain localities, but generally disappearing upon culture—Flowers from the 20th of April.

Syn. Scilla Esculenta. *Bot. Mag.*
Phalangium Quamash. *Pursh.*

41. Genus. ASARUM. L.

(*Deriv.* The Latin name of a plant, spoken of by Pliny.)

Class 11th. DODECANDRIA—Order, MONOGYNIA.

Gen. Ch. *Calyx* 3—4 cleft, superior, persistent. *Corolla* none. *Anthers* adhering to the sides of the filaments. *Capsule* 6-celled.

Species 1st. Asarum Canadense. *Wild Ginger.*

Sp. Ch. *Leaves* 2, broad-reniform: *calyx* woolly, deeply 3-parted, reflexed.

Obs. The wild ginger is readily detected, by its two large kidney-shaped leaves, supported on long footstalks, and covered with a velvet softness,—by its solitary and singular flower issuing from the axil of the two leaves; and by the aromatic odour of the root, which has given it its common name. Occasionally abundant in rich shaded woods among rocks: flowering about the 20th of April.

We have followed Michaux, Muhlenberg and Elliott in placing this plant in the class Dodecandria, although by Pursh, Nuttall, Barton and Torrey it is ranked under Gynandria; and by Darlington in Polyandria.

Syn. A. Carolinianum. *Walt.*

42. Genus. CAULOPHYLLUM. *Mx.*

(*Deriv.* Greek *Kaulos*, a stem and *phyllon*, a leaf: from the resemblance of the stem to a leaf-stalk. *Michaux.*)

Class 6th. HEXANDRIA—Order, MONOGYNIA.

Gen. Ch. *Calyx* 3—6 leaved. *Corolla* 6-petalled, with a subreniform nectary on each claw. *Berry* stipitate, 1-seeded.

Species 1*st.* Caulophyllum Thalictroides. *Pappoose-root.*

Sp. Ch. Glabrous; *leaves* supradecompound; leaflets oval, terminal one 3-lobed.

Obs. This, the only species of the genus, was once abundant throughout this country, but has now almost disappeared from the more cultivated districts, and is consequently rare about Lexington, being only met with in the more secluded and unfrequented woodlands. It grows to the height of 12 or 18 inches, producing a single triternate compounded leaf; and a panicle of small greenish-yellow flowers, succeeded by dark-blue berries which are covered with a mealy powder.

Under the name of *Pappoose-root* this plant has had some medical virtues ascribed to it.—Flowers towards the latter part of April: berries ripe in June.

Syn. Leontice Thalictroides. *Willd.*

43. Genus. ÆSCULUS. L.

(*Deriv.* Latin *Esca*, food: the fruit of some of the species being esculent.)

Class 7th. HEPTANDRIA—Order, MONOGYNIA.

Gen. Ch. *Calyx* 1-leaved, 4—5 toothed, ventricose. *Corolla*

4—5 petalled. *Petals* unequal inserted upon the calyx. *Capsule* 3-celled. Seeds large, solitary.

Species 1*st.* ÆSCULUS PALLIDA. *Common Buckeye.*

Sp. Ch. *Leaflets* by 5s: *corolla* 4-petalled: *stamina* mostly 7, twice the length of the corolla: *fruit* spinous. *Pursh.*

Obs. This species is abundant throughout the forests in the rich lands of Kentucky. It is a tree of but ordinary stature, and for the most part of crooked growth, remarkable for the early period of its foliation, being the first of our trees to become green in the spring, and the earliest to cast its leaves in the fall.—The fruit is a large nut of a bright brown colour with a very remarkable hilum or eye, which has given the tree its common name: it is sometimes eaten by cattle, and often with fatal effects: Flowers about the 20th of April, and is then a very beautiful object: fruit ripens in September.

Syn. Pavia Lutea. *Mich. fil.*

Species 2*d.* ÆSCULUS FLAVA. *Sweet Buckeye.*

Sp. Ch. *Leaves* by 5s, pubescent underneath near the midrib, equally serrulate: *corolla* 4-petalled, with the claws of the connivent petals longer than the calyx: *fruit* unarmed.

Obs. A much larger and straighter tree than the preceding, but less abundant than it, being in this locality confined to the alluvion bottoms of the Kentucky river. Unlike the former the wood of the sweet buckeye is susceptible of being applied to many useful purposes.—The flowers are unfolded towards the end of April and are succeeded by smooth capsules containing one or three large seeds.

Syn. Pavia Ohioensis? *Mich. fil.* Sylva. Amer.

STELLARIA. (SEE GENUS 4.)

Species 2*d.* STELLARIA PUBERA. *Starwort.*

Sp. Ch. Pubescent; *leaves* sessile, ovate, ciliate; *pedicels* erect; *petals* longer than the calyx.

Obs. This species differs from the *S. Media*, before mentioned, in its less branching, and more erect habit. A single stem rises to the height of 6–8 inches, bearing a few comparatively large flowers. Rare; in woodlands. Flowers 20th April.

(TO BE CONTINUED.)

ART. VII.—*On the Diseases which appeared in Henry County, Tennessee, in the summer and fall of* 1827 *and a brief account of their treatment, with remarks on the weather during the same time.* By JOHN TRAVIS, M. D. of Henry County, Tennessee.

The fact is generally admitted by every intelligent physician of the Western District of Tennessee, that the atmosphere is more humid here than it is in Middle and East Tennessee, or in Carolina. This may be accounted for from natural causes. The Western District is generally a low country, abounding in many water courses, upland ponds, and extensive marshy bottoms on each side of every river, creek and branch.

Independent of these streams in the interior of the country, the district is bounded by the great rivers, Tennessee and Mississippi. The rivulets in general have but little fall. Millponds are common, and in consequence of the level surface of the earth, immense bodies of land are covered with water. The soil is covered with vegetation, particularly in the *barrens*. It is also believed that more rain falls here than in any other part of Tennessee. The Indians disliked this section of country, and in their own peculiar mode of expression, said it was "*too leaky.*" The soil is fertile; it is mixed with sand, and produces cotton, corn, wheat, rye, &c. abundantly.

The spring of 1827 was distinguished by the fall of unusually large quantities of rain. The wet weather operated very much to the prejudice of farmers, particularly in regard to the cultivation of their cotton crops. The summer was dry, and the latter part of it and the fall unusually so. The month of July was very hot, and also a part of August. Notwithstanding the intense heat of the weather, when the mercury ranged from 90° to 93°, the dews were very heavy. Immense fogs darkened the country every morning. In the beginning of June, the in-

termittent fever made its appearance, and became pretty general throughout the country. There were a few cases of remittent, and still fewer of bilious fever this year. I have not seen one case of severe bilious or typhus fever during the year 1827. The intermittent fever is uncommonly severe here. In many instances it proved too obstinate for the ordinary means of cure—i. e. emetics, cathartics, and cinchona, in its common form. Other means had to be resorted to, and I found none so effectual as the sulphate of quinine. This I gave in Madeira wine, or grog; and sometimes in powder. This latter mode proved most successful. Ten grains of quinine in a pint of wine, and an ounce given six times a day, or two ounces three times a day, is the manner in which I gave it. In the form of powder I gave two or three grains thrice a day, and for one day only, and it invariably effected a cure, except in a few instances, where there existed great derangement of the viscera. Previous to the administration of the quinine, the primæ viæ were cleansed of their morbid contents with antimonium tart. and sulph. magnesiæ.

Although the quinine effected a speedy cure, yet the disease in a few instances returned, as often happens with this disease. The medical records of the whole civilized world afford ample testimony of the fact, that no disease is more apt to return, from slight causes, than the *febris intermittens*. To prevent this, a regular course of tonics should be persevered in for 15 or 20 days after the disappearance of the disease. If any remedy approaches the character of, or is a specific for intermittents, that remedy is the sulphate of quinine. The celebrated French Chemist, Pelletier, deserves immortal honor for this valuable discovery. I have also cured the intermittent fever with the tinctura opii.

There appeared sundry cases of *cynanche trachealis and cholera infantum* this year. These generally yielded to the ordinary modes of treatment. A few deaths happened within the bounds of my practice, in very young subjects, and where medical aid was not timely solicited.

Pneumonia was common, although in an extensive practice I did not lose a patient. The free use of the lancet, emetics, cathartics, sudorifics and blisters effected a cure.

Ophthalmia was very general this year, although it was not violent nor of an obstinate character. It very readily yielded to simple collyria. There was in no case a necessity for venesection.

Pertussis was very common this year. A few cases in very young subjects terminated fatally—but these cases were connected with other diseases. *Worms* affect children here more than in any other part of America with which I am acquainted. The lumbrici appear much more numerous than any other species of worm. In this disease the submurias hydrargyri and spigelia marilandica proved most successful in my hands. I can safely recommend these articles as the most valuable Anthelmintics in the Materia Medica. They have at least uniformly proved so in my practice.

It may be here remarked in conclusion, that diseases of women and children are very common in this district. The diseases of utero-gestation and parturition are very severe in many instances; and death has often occurred from puerperal fever.

ART. VIII.—*Case of Hysteria attended with some peculiarities.* By JAMES CONQUEST CROSS, M. D. of Courtland, Alabama.

Early in the night I visited Miss T. W. æt. 17, and found her alternately laughing and crying. In the morning, in attempting to jump from the door to the ground, a distance of about three feet, she so slightly injured her ankle as to occasion no complaint till 5 P. M. when the pain became exquisite. There was, however, no redness, swelling, heat nor any other indication of disease. The pain continued about an hour and all at once, without any obvious cause, ceased, when she became affected as above mentioned. Besides the laughing and crying, the ordinary symptoms of hysteria were present, and considering it no-

thing more than a common paroxysm of the disease under consideration, without involving in its character any thing of seriousness or danger, and believing that it would soon subside, I exhibited a small quantity of sulph. ether in combination with tinct. theb. and left her to visit another patient in the neighbourhood. In about an hour, however, I was again sent for and found that so far from the paroxysm having subsided, as I had anticipated, it had increased in violence. Globus hystericus was now obvious; great stupor prevailed, with violent contortion of the features of the face and protrusion of the tongue, which had been wounded by the gnashing of the teeth. Flatulent eructations from the stomach in quick and rapid succession, and considerable distension of the gastric region also attended. Having repeatedly cured hysteria with great readiness by the employment of the remedies already mentioned, I was a good deal surprised that they had produced no benefit in this case. After producing emesis with as little advantage, they were repeated in conjunction with belladonna, which has been recently much extolled, but without being productive of any benefit; after which, as ineffectually, opium was given in considerable quantity. These remedies were employed during the first six hours, and although the convulsions had moderated somewhat in violence, I was persuaded that it was owing more to the fatigue and exhaustion from uninterrupted exertion, than to the agency of the remedies exhibited. At this time her respiration had become much slower and the inspirations in particular were deep and far between: this circumstance I watched with considerable anxiety, and observed that they continued to grow deeper and the intervals more protracted. I became alarmed and applied hartshorn to her nose, and immediately a sudden and violent respiratory struggle took place, which lasted but a moment. My consternation can with difficulty be conceived when I discovered my patient ceased to breathe,—pulseless in the carotids and radials, and her eyes wide open. Every one present thought her dead, nor was I certain that such was not the fact. She continued in this situation perhaps ten minutes, but of this I was not certain, so great was the prevailing con-

fusion that it was impossible to form an exact estimate of the time. I placed my hand upon the region of her heart and thought I observed an obscure and feeble fluttering. Thirty drops of the spirits of hartshorn diluted in a little water were with great difficulty introduced into the stomach. No immediate impression seemed to be made—strong sternutatories were employed and at length respiration was resumed,—the radial artery feebly pulsated, and the functions generally in a short time seemed to be completely re-established. No hysterical symptom remained, and what occasioned me no little surprise was to find that at the moment she appeared to be freed of her disease, the exquisite pain in the ankle returned. The joint was again examined; no evidence of disease could be discovered; handling it did not increase the pain, nor was it augmented by extension and counter-extension to which I resorted, suspecting that perhaps, the bones of the joint might have been slightly luxated.

My reflections now flowed in a new channel, for though I was incapable of explaining the connexion between the pain in the joint and the hysterical phenomena, I was persuaded that such a connexion existed, and that it must be better theoretically or practically understood, or she could not be restored permanently to health. While absorbed in these reflections the pain suddenly ceased, and the patient immediately exclaimed "I am choking;" and was soon hysterically convulsed. The whole mystery of the case I believed was now developed; I felt a strong conviction that the induction of a considerable degree of pain, which could be directed and controuled at pleasure, would dispel the hysterical symptoms, and that if kept up for a considerable length of time it would eventually break up the train of associated action by which the original injury of the joint was connected with the hysterical phenomena. No article promised fairer to answer this purpose than cantharides; a blister was consequently applied that embraced nearly the whole ankle. No other means were resorted to to check the hysterical symptoms, as I was specially anxious to discover what influence would be exercised over these from the progressive operation of the blister. An hour elapsed

before any thing of moment occurred; at this time the flies had only reddened the part; the pain, however, which seemed to be deep-seated in the centre of the joint, again made its appearance, but was much more supportable than it had previously been. The convulsive phenomena were little if at all changed in character, and this condition lasted two hours longer, when the blister had operated finely. The pain in the interior of the joint was inconsiderable and appears to have been translated to the surface, and all my speculative expectations began to be realized; the hysterics were obviously diminished and rapidly subsiding and in a very short time entirely disappeared. The vesicatory was allowed to remain on the part ten hours from its application, and when removed the part was dressed with basilicon ointment.

Apprehensive that when the blistered part healed, we might have a renewal of the hysterical phenomena, I directed that when this should be manifested the cantharides should be reapplied and this course to be continued for three weeks. At the expiration of ten days, however, this advice became both irksome and painful, and she determined to abandon it, confident she had nothing to apprehend. The part consequently soon ceased to discharge, but this event had not taken place more than three days when she was threatened with all her former afflictions. This timely warning made her more tractable for the future, the practice was resumed and continued a month, at the expiration of which time the discharge was gradually and slowly diminished, and was at length entirely dried up. She was completely restored to health and has remained so ever since.

ART. IX. *Case of Retroversion of the Uterus relieved by the extract of Belladonna and Laudanum.* By DR. JOHN MILLS, of Winchester, Kentucky.

On Friday May 9th, 1828, I visited Mrs. T. aged about fifteen years, of slender and delicate form and small pelvis, and of the sanguinco-choleric temperament: she was near the fourth month of her pregnancy.

I found on examination a complete retroversion of the uterus. She had been labouring under this deplorable malady upwards of two weeks; her physician had been able to relieve the bladder once only by the aid of the catheter; her bowels had been acted on twice only, and each time partially. The only relief she obtained was by placing herself in a half-bent position, and with violent hands distorting the urethra; by which means she procured, at times, a spoonful or two of urine; at other times she failed in obtaining any by her utmost exertions. Her anguish was strongly expressed in her countenance and in her hurried impatience. Every attempt at reduction of the uterus to its proper position proved abortive, owing to the bladder occupying the pelvis. The introduction of the catheter was entirely prohibited by the pressure of the os tincæ against the neck of the bladder; the rectum was choked by the wedging of the fundus of the uterus, still held down by the enlarged bladder, so that all efforts to force injections into the rectum proved fruitless; the urethra was so sensitive as to preclude the use of the catheter; the least attempt with any size or kind of catheter, produced the most excruciating pain imaginable. Bleeding and the usual remedies had been resorted to previous to my visit.

I adopted the following plan: a scruple of extract of belladonna was dissolved in two ounces of warm water; half an ounce of common laudanum was added: with this mixture the small space left in the vagina was filled by means of a syringe, which took about half, and the balance was thrown up the rectum; most of it was retained. In an hour she fell into a quiet sleep and continued easy, but complained of sick stomach every time she awoke. She also complained of feeling intoxicated, and vomited after drinking twice or thrice; her thirst was very great. Having obtained the desired relaxation of all the muscles of the pelvic region, I again commenced with an elastic catheter of the larger size, but was compelled to exchange it for a smaller one, which I found to pass but not without a strong stillette for its support: I continued this with a twisting motion similar to that of boring with a gimlet,

in order to clear the point of the catheter from the follicles of the urethra, and in half an hour, without pain, by these means the instrument was passed into the bladder; when six or seven pints of urine were drawn off to the entire relief of the patient. I now endeavoured to replace the uterus but found it still immoveable: I then passed a large elastic catheter into the rectum, its full length, until the point passed above the uterus, and through it injected six pints of salt and water into the intestine, when some pain ensued, which was made the criterion for discontinuing the injection. My patient now required the room, and in half a minute the whole injection came off bringing with it a quantity of indurated feces, and in a few minutes two or three more discharges of feces came off. The uterus was then without difficulty replaced; after which an elastic pessary was applied with orders for it to be worn eight days unless it caused uneasiness; in which case instantly to withdraw it. I left her under the care of another physician: she continued to vomit six or eight hours afterwards, when the vomiting ceased; and no further medical aid had been necessary when this was written, five days after I left her. I am aware that the belladonna has been recommended and probably used in Germany for the purpose of dilating the os uteri in cases of rigidity; also of its use in Great Britain in order to dilate the pupil of the eye in the operation for cataract; but I am not aware of its being, in any case of uterine disease, used in the United States, except in one in which it was successfully used to dilate the vagina, which had become contracted and indurated. In this case a sponge tent was coated with the extract of belladonna, and inserted into the vagina; at the expiration of two hours it was withdrawn, when I found the relaxation of the vagina so complete, that the hand was readily admitted and delivery accomplished in a few minutes.

The reason of my using the laudanum in the first case in addition to the belladonna, was because of the great sensibility of the urethra: I was not sure that the belladonna alone would subdue it; neither did I believe that laudanum alone would produce the relaxation necessary in this case, and diminish the excessive sensibility of the parts.

ART. X. *Cases of Lithotomy; with observations.* By LUNSFORD PITTS YANDELL, M. D. of Murfreesborough, Tennessee.

Hudson Hollis, a boy æt. 10 years, had suffered with the stone from the time he was six years old. The whole round of domestic remedies was gone over, and medical skill employed, with but temporary advantage. The carb. sodæ diminished the irritability of the bladder, and gave transient ease. His nights were spent in great agony, the paroxysms of the disease being much more frequent, protracted, and severe during this period. Through the day he was capable of pretty active exercise on foot, and was able to ride on horseback without much inconvenience.

When he came under our care about the 1st January last, although his complexion was pale and somewhat sallow, and he was small of his age, his appetite was good, he was sufficiently vivacious, and all the functions of his body appeared to be regularly and effectually performed. After preparing him for it about two weeks, he was submitted to the operation on the 13th of January. Nothing to embarrass occurred in the progress of it; the stone lying near the neck of the bladder was found and extracted with facility. The instruments used were of the smallest size, the gorget being the least in the case, and the forceps, a pair belonging to a pocket case. The stone was small, of the "triple" species of Paris, an *ammoniaco-magnesian phosphate.* Considerable depression succeeded, but did not continue long.

A bed properly constructed, not having been prepared before the operation was commenced, he was placed at first on a common feather bed; and we committed, at the same time, the additional error, inculcated in most of the books of surgery, of tying his knees together. Owing to this mismanagement, the blood poured out on reaction was emptied into the bladder, which being expelled about thirty hours afterwards, in the form of coagula, brought on such hæmorrhage as came well nigh destroying the patient. He was greatly prostrated by the loss of blood, and his convalescence was slow. A fistulous open-

ing remained in the perinæum for more than a month after he got about, but he is now in the enjoyment of perfect health.

William Goodloe, æt. 6 years; afflicted from about the time he left his mother's breast. When we saw him in April his sufferings were of the most excruciating kind; he was incapable of any but the gentlest motion; and pus was occasionally voided with his urine. We put him upon the preparatory plan, and appointed to operate on the 11th day of May; but when we arrived at the house of his father we found him labouring under so much fever, and his general system appeared so much disordered, that we were deterred from proceeding at this time. Before leaving him we drew from him ℥viii of blood, which induced deliquium, followed by two alvine evacuations in quick succession. By means of antiphlogistic remedies the fever yielded in about a week, leaving the patient greatly debilitated. Believing that he could not, in a state of so great debility, support under the shock of the operation, we ordered him, with a view of his invigoration, the oxide of iron, with the acid. sulphuric. aromat. under which plan his health recruited.

The 14th of June was set for the operation, and a young gentleman sent, early in the morning, to make every thing ready. We were disappointed on our arrival to learn that the paroxysms of his disease had been more frequent for the last twenty-four hours, that he laboured under some febrile excitement, and that he had discharged pus in great abundance, from the urethra. The latter symptom led us to apprehend the existence of disease of the kidney; but ascertaining on enquiry that he had voided no urine for several hours, the pus still escaping, we became satisfied that the discharge was either from the neck of the bladder or the urethra, and determined on proceeding to the operation. On introducing the sound, we detected the stone firmly impacted in the cervix of the bladder. The operation was performed in the usual manner, and a stone extracted as large as a middle sized walnut, weighing more than an ounce, of the "fusible" species of Paris, the *phosphate and ammoniaco-phosphate of lime.* Appre-

bending some danger from the immediate effects of the operation, we had some brandy toddy administered to him during its progress, and were pleased to see that it warded off entirely the depression which usually ensues.

As soon as the stone was removed the little sufferer exclaimed he was easy, and has continued free from pain ever since. The second day after the operation the urine came in the natural way, attended by a chill, and continued thus to pass off for twenty-four hours, when it returned to the wound; but on the seventh day, the incision having closed, it was discharged naturally through the urethra. In this case we were careful to prepare a bed previously to entering upon the operation, and we allowed the patient's knees to remain separated until granulation commenced. Thus the hæmorrhage, quite inconsiderable, which occurred after his removal from the table, was permitted to pass freely out of the wound, and occasioned no inconvenience. The wound is at this time (24th June) nearly cicatrized.

In his lectures on surgery, Sir Astley Cooper forbids the operation when pus is voided with the urine. If we had acted upon this principle, our little patient would inevitably have perished. But Sir Astley would have seen, as we did, that the pus in this instance was not the result of a suppurating kidney; and the case may teach the inexperienced, that a discharge of pus is not always to deter from the operation.

REVIEW.

ART. XI. *Medical and Physical Memoirs*, (New Series.) By CHARLES CALDWELL, M. D. Prof. &c. Printed at the request of the Class: Lexington, 1827. COMMUNICATED.

No scientific institution was ever the centre of greater attraction, or was more extensively and zealously blazoned, or ever diffused, in the same time, more important and lasting benefits, than the *Medical School* of Transylvania. Situated in a country of immense size, of almost unequalled fertility, and whose moral institutions are not surpassed in the exuberance of their growth by its vegetable productions; where sickness greatly prevails, and physicians abound; with no rival institution near, and with chairs filled at first by professors of talents and repute; it sprung, like Minerva, to maturity at once. Its *elves* are to be found in every town, and village, and neighborhood in the great valley of the Mississippi; and, if not in general science and profound erudition, in energy and boldness of practice, in their tact for marshalling into service and using to the best advantage, their whole stock of knowledge, they would bear an honourable comparison with the more lauded schools of the East.

That we may be enabled to see the beneficial effects of its operation, we will take a cursory survey of the situation of Western society, at the time the school was organized. So remote was our situation from the Atlantic cities, and the expenses incident to a trip there, were so onerous, that not more than one medical student in twenty, was able to attend a course of lectures; while the demand for physicians in a new, sickly, and rapidly populating country, being great and increasing, young men were compelled to embark in their profession, with but a small amount of the requisite information; and although in time they often became active and skilful practitioners,

they could not, at first, labour understandingly; and, for want of the proper collegiate discipline, were unable to impart their knowledge, and consequently, to aid in sustaining the march of medical science.

Hundreds of men were engaged in arduous, obscure practice, without diplomas, and with no higher aim or ambition, than to cure their patients, and get their money for it. Now the school has had the effect of increasing the industry and intelligence of the old, and of affording convenient, accessible instruction to the young. It has drawn from the desert the talents which might have been spent there, in unaided, and comparatively inefficient labours, and has moulded, and polished, and turned them to good account. It has developed our native energies, and revealed to us our intellectual resources, which, might otherwise have continued long hidden and unknown. It has awakened fresh emotions of professional pride, and a love of literature and general science, in our country, and drawn into the ranks of the medical profession, a host of well trained practitioners and scholars. It has worsted empiricism in the West, and given increased dignity and higher standing to the profession of Medicine.

Its location was favourable to these results. Lexington, partly, perhaps, in the self-love of its inhabitants, but with much justice, has been styled the "Athens of the West." Its late distinguished President spoke to his class with an eloquence and enthusiasm on mental philosophy, that have been rarely equalled; and while he descanted on the qualities of the human mind, and dwelt upon the immortality of the soul, and its longings after purer, and brighter, and more enduring knowledge and felicity, they saw the golden everlasting chain that hangs from heaven to earth, and were made to feel proud of their nature, and enamoured of that wisdom which so dignified and exalted the man. Its ladies too, were cultivated; and when the students sought in the enchantments of their society, an oblivion of hard study, and heated lecture-rooms, they found them ever ready to enter with their wonted felicity and ease, upon the ordinary topics of literature and philosophy.

They breathed thus, during their four months stay, an intellectual atmosphere, and walked over ground consecrated to letters. From the eloquent rostrum of the President, to the chair of him whose task it was to speak of sympathy and phrenology; from the anatomical amphitheatre to the drawing room; they received instruction and dwelt upon objects calculated to elevate and expand the mind. They caught the predominating spirit and with heads teeming with books, with a fondness for conversation engendered by their late society, and with minds wedded to intellectual pursuits, they returned to spread the influence among their youthful associates. The cause of letters received thus a fresh impulse. They all came home colloquialists; and it does not belong to the character of the western people, to be backward in telling what they know. They were full of ideas, and aspirations, and phrenology; Dr. Galls in miniature; ready to reveal the occult character, and to teach to every one, the *gnosis seautou.* They were generally enthusiastic, and often wild, and vain; but they had imbibed the literary taste, and were animated by the proper zeal. They gave a new turn to thought in the West, and introduced among the thinking and reading, a new fashion; that of studying and discussing science, in all its forms and branches.

These are some of the changes and blessings which have attended the operation of Transylvania; and now if she were struck, with her lamented President, from the list of existing things, all who have witnessed and felt, as we have done, her benign influence, would feel ever grateful, and would teach their children gratitude to the great minds which erected her temples, and which ministered at her altars in the day of her prosperity.

But things are not so to be. Much as she had already done, she is destined to effect yet greater changes in the moral condition of the West. We have but commenced our scientific pilgrimage, and are yet in the wilderness. A field, vast in dimensions, and rich in objects of curious inquiry, lies before us, and is to be explored by the alumni of Transylvania. Our diseases have not yet been well treated of, and in fact, sufficient science has never

been brought to their investigation; the remedial treasures of our vegetable kingdom, are unstudied and unknown; and our mines, with their riches, remain unexplored. The country continues to increase in population with unexampled rapidity. Physicians are still needed—the wants of society demand as many as ever. Transylvania is the source to which we look for a supply of the labourers in this important field.

But the improved state of society in this part of the Union, requires that the standard of professional excellence should be elevated; more rigour must be practiced in examinations for degrees; there should be increased vigilance in the State regulations; mediocrity in Medicine, if it ever was, is now no longer tolerable. Against empiricism in every shape all members of the profession should begin to make common cause: in relation to it let their motto be, '*burn, sink, and destroy.*'

The diversion having now been made from the Atlantic schools in favour of that of the West—a diversion rendered almost necessary by moral, as well as physical circumstances, few students will ever now think of crossing the mountains. The reputation of Transylvania is such, that even the wealthy, who could well afford the costs of a trip to the eastern schools, are content to spend their first, and often their second winter within her walls. When they visit the East, it is to see mankind, and institute a comparison between its more celebrated institutions, and their alma mater; and they generally return with impressions favourable to the latter. We think every young medical man, who could afford it, would do well, before entering upon his profession, to make an excursion to our Atlantic borders. Such an expedition will tend to liberalize his views, and enlarge the treasures of his mind. It will exhibit to him human nature in its various aspects, as modified by culture and fashion, and will teach him to deem correctly of himself. He will there see a state of society much more cultivated and luxurious, than any which prevails in our woods; he will be presented with the various works of art in their perfection; and more, he will be brought in contact with men of his profession, who, enjoying from their birth better opportunities, have cultivated the muses with greater industry, and are more

extensively versed in professional and general science, and will thus return with a more elevated ambition.

In the progress of western improvements, and in the growth of its society, it is probable, nay it is perfectly certain that other and rival institutions will ere long spring up. The number of students in the west and south, is already too great, to find accommodation in one school. In a quarter of a century, our population will be nearly doubled: and, at the present rate of increase, the youthful votaries of Æsculapius will be more than tripled. Ours must always be a land of doctors; for while it is one in which the "pestilence walketh," our diseases are of a nature susceptible, beyond the distempers of most countries, of cure. At present, there appears to be a falling off in the numbers, throughout the Union. This is owing to a pecuniary pressure, which almost universally prevails. And other causes operate at this time on Transylvania. When she went into operation she found a numerous class of practitioners, labouring industriously in their callings, without the proper credentials. These flocked to her, and contributed to fill her classes for the first four or five seasons. This source is now dried up. And besides this, there is a kind of glut in the professional market; the ranks of the Faculty are too much crowded; too many young candidates for fees, are doomed to follow at the fag-end of their profession; this has alarmed others qualifying themselves for the vocation. But this depression will be of but short duration. The commercial storm which has beaten upon us with such severity, will soon pass over, and the numerous students who have been kept back for want of means, will again fill her classes. We feel confident that, like the Philadelphia among the eastern schools, Transylvania, among those of the West, from its delightful situation in a country of hospitable, intelligent people, where all the necessaries of life are furnished in such abundance, and so cheap; from the ability of its teachers, and from its advantages in age and reputation, will continue to maintain a decided pre-eminence. She has a deep and strong hold upon the affections of the Western Faculty. Her pupils are bound to sustain her, and western young men are not wont to support with a timid, a

wavering, or an irresolute arm. Their hearts are engaged in the matter; all the good feelings of veneration and love for a scientific parent are enkindled; and with the moving recollections of benefits enjoyed, and of hours of tranquil and pure happiness spent within her walls, they are engaged body and conscience, in her sustentation. It would be a fickleness of which wise men are not guilty; it would be ingratitude to a parent, and to one who has fostered them with more than ordinary parental care; it would be desertion, and that of the unworthiest kind, for her pupils now to grow cold to her interests.

But we hasten to give an analysis of the last of these memoirs, which we consider a strong, sensible, impartial expose of the condition, advantages, and prospects of Transylvania; passing over the two first articles, for the evident reason, that they belong rather to ethics than to medicine.

The author in the first place sets about refuting the doctrine, that an eastern school possesses advantages to the western student over one of the west. He thinks diseases cannot any where be so well taught as in the country where they prevail, and by teachers who have observed and practised among them. We give his own language.

"Unless the treatment be thus skilfully varied, and accurately adapted to the character of the complaint, it is likely to prove injurious rather than salutary. For want of that aptitude which is, in all cases, essential to a successful result, it will certainly fail in the production of the contemplated effect. Hence physicians that have practised with distinguished and well deserved reputation, in one district of country, have been found, until taught by experience, not only much less successful, but even exceedingly unfortunate in their practice, when transferred to another, more especially to a distant and dissimilar one.

"It is well known that the ablest physicians of Europe are ignorant of the treatment of the diseases of America. The most skilful of them, therefore, that have ever migrated to the United States, have proved, on their first arrival, very inefficient practitioners—novices comparatively in the management of our complaints. Native physicians greatly, perhaps, their inferiors in talent and attainment, have been not a little superior to them in successful practice. To render them competent to their duty, and equal to themselves, a further apprenticeship of some duration, to observation and experience, has been found essential." *Mem. VI. page* 71.

"The general principles of medicine may be taught and learnt in any

situation. But suitable adaptations of practice to peculiar modifications of disease can be learnt only by experience, in the treatment of such modifications, and efficiently taught by none but those who have thus acquired experience. To pretend to the acquisition of this knowledge in any other way is no better than imposture. No physician, then, whose sphere of observation has been confined exclusively to the large cities of the Atlantic states, more especially to those that lie northward from the Potomac, has a competent knowledge of the peculiarities and treatment of the prevailing diseases of the West and the South." *page* 73.

The author then replies to the objection that a large city is necessary to effective medical instruction.

"Faithful and accredited records, to which reference might be easily made, and which cannot fail to be within the knowledge of every one versed in the history of our profession, teach us, that in towns neither "large nor populous" very distinguished schools of medicine have existed, and do exist. Nor can one substantial reason be assigned, why such existence should not be permanent. But, were the present a suitable occasion to discuss the subject, reasons not to be subverted, might be readily adduced, why a large, populous, and commercial city is a much *less* suitable seat for either a school of medicine or any other school for the instruction of youth, than a town of a size and population greatly inferior.

"In no other place but a crowded city, say some, can subjects be procured in sufficient abundance for all the forms of anatomical instruction.

"This is a mistake, as the records of the school of Transylvania prove. This institution is now in the ninth year of its existence; and, notwithstanding the trembling apprehensions of its timid friends, and the evil bodings and calumnious misrepresentations of some of its enemies, it has never, *for a single hour*, been in want of a subject for the purposes of anatomy." *page* 74.

"In refutation of this" (that surgery cannot be so well taught) "I again fearlessly offer the example of Transylvania. Let the comparison be made, and it will be found, that in proportion to the size of its classes this school has produced, since the date of its establishment, a greater number of surgeons, qualified to operate with respectability and success, than any other in the United States." *page* 75.

"Why should not the pupils of this institution be accomplished in surgery? The public instruction they receive by lecture is unsurpassed; and it will be found, on computation, that, for the last four or five years, the professor of that branch has performed before his class as many important surgical operations, as have been exhibited, during the same period, to any class in the United States. From the reports that have been communicated to me from other schools, I conscientiously believe that he has performed more. But be this as it may, it can be easily

made appear, that by far the ablest and most successful young surgeons, that have settled in the valley of the Mississippi, since the year 1820, have been educated in Transylvania." *page* 76.

It is objected that there are no hospitals in Lexington. The author replies that medical students have no leisure, during the two courses usually attended, to profit by hospitals; that the diseases of such institutions are mainly of a chronic character, and beyond the reach of medicine; that a large class cannot surround the bed of a patient, to make the examinations which are instructive; and that the plan of attending to the patients in them, with nurses &c. is too expensive for country practice, the only kind that we in the West have much to do with. For these reasons, and we think with him, he considers the advantages of hospitals to medical students, attending but two courses of lectures, four months each, nominal merely, and not real.

He refers thus to this Journal.

"As from every point of the mighty valley, to which he has given his name, currents hasten to swell the treasures of our *prince of rivers*, I firmly trust, that, from every portion of the same region, where the wilderness has yielded to civilized man, currents of knowledge will ultimately flow, to fill the repository the editors have established for the benefit of a profession, the interests of which it is at once their duty and their ambition to promote. And to this effect my confidence is the stronger, inasmuch as all those on whom they rely for tribute will be equally interested in the enterprise with themselves—in whatever honours or more substantial benefactions it may eventually bestow on medicine in the West. For, of all the maxims that time has established, none is more true, and few more important, than that expressed in the three words "*qui docet, discit*"—he that teaches others, teaches himself." *page* 82.

"A sentiment of gratitude for benefits received, a due regard for the honour and interests of their profession at large, but especially as confined to their own country and the region where they reside, feelings of local patriotism urging them to the aggrandizement of their native or adopted portion of our Union, the welfare of the human family as connected with the preservation and the restoration of health, and the powerful incentive of personal reputation—such are the motives, which, added to their immediate interests, invite the physicians generally of the valley of the Mississippi to co-operate in the establishment of a journal of medicine." *page* 83.

"But to the numerous pupils, in particular, of the school of Transylvania, who are scattered over such an extensive portion of that valley, or residing elsewhere, I would venture to address myself on a different

ground. By remembrances, and other considerations, which rarely fail to find their way to the hearts of the youthful, and even of those who are advanced in years, I would ask from them matter to enrich the pages of the work that is established at the place where they were educated.

"United to other inducements to incline them to patronize it, a journal so immediately associated with their alma mater, cannot easily, and in public estimation, will not, be separated entirely from their own standing and character; and must, therefore, naturally and necessarily have a hold on their affections.

"By the pledge, then, of those affections, called forth during the glow of the spring-time of life, when they were in quest of education, by the tender and high estimation and regard in which they hold that education, and by their attachment to the *fountain* from which it was derived—as they are anxious that the *former* be deemed efficient and valuable, and the *latter* maintain her honourable standing among the institutions of America, and continue to prove a blessing to the great community of the West and the South—By these considerations, I say, and such other kindred ones as may suggest themselves to their own intellect, I would solicit them to unite their labours with those of the editors, to enrich and sustain a journal, in the character and fate of which those several feelings and interests are deeply concerned." *page* 84.

L. P. Y.

ART. XII. *Biographical notice of* DR. FREDERICK RIDGELY, *late of Lexington, Kentucky.*

Doctor Ridgely, descended from parentage of the first respectability, was born on Elkridge, Annarundel county in the State of Maryland, May 25th, 1757. Having pursued the common course of collegiate studies, at the Academy of Newark, in the State of Delaware, then the most flourishing school in that part of the country, he commenced, in his seventeenth year, the study of Medicine under the tuition of Dr. Philip Thomas of Fredericktown, a physician whose reputation was almost unrivalled.

How long his term of pupilage continued does not exactly appear, but he was no doubt drawn off from the labours of the closet and the shop, by the spirit-stirring temper of the times; for the great political events then brewing, pregnant with the destinies of half a world, found in our young physician's patri-

otic bosom, warmth and devotedness congenial to the occasion. At the first commencement of hostilities he promptly offered his personal services to his country, in that capacity in which they were most needed; and we have the fullest assurance of the proficiency which he had already made in the acquirement of professional knowledge, when, at the early age of nineteen, he was appointed surgeon to a corps of rifle-men, raised in the upper counties of Virginia, and the adjoining parts of Maryland, and commanded by Captains Stinson, Cresap, and Morgan, afterwards the illustrious General, whose name struck terror to the hearts of our enemy. With this detachment he marched to the North, where the cloud of impending warfare had already burst at Lexington, and arrived before Boston but a few days after the celebrated battle of Bunkers-hill, in June, 1775.

The capital of Massachusetts was at that time in possession of the British, under the command of General Gage: and in the long investment which followed, until the triumphant entry of the American army, under General Washington, Dr. Ridgely continued to fulfil the responsible station, and to discharge the arduous duties of hospital physician, rendered peculiarly arduous by the unusual sickness and mortality which at that time prevailed among the troops.

Adhering to the fortunes of his country, we see him following the army during the perilous campaign of 1776, when the gloom of despondency and the spirit of desertion seem to have seized upon all but the stoutest hearts. In the spring of 1777 his native state conferred upon him an additional mark of her regard, by appointing him surgeon to the 4th Maryland regiment of regulars, commanded by Col. Hall, Lieut. Col. Samuel Smith, the hero of Mud-Island and now Senator in Congress, and Major John Eager Howard, justly styled the Champion of the Cowpens, but whose military skill and prowess were conspicuous in every battle where he fought. United with this band of worthies the Doctor had the honor of participating, so far as his station permitted, in the descent on Staten-Island; the affair of White Marsh, the engagements of Brandywine and Germantown which shed such imperishable glory over the American arms,

and gave to the world an earnest of the future darings of her yet unfledged eaglet.

In the spring and summer of 1778 we find our surgeon doing duty in the military hospitals, until October, when the British army having evacuated Philadelphia, and the American troops being about to go into winter quarters, he resigned his appointment; and availing himself of the opportunity which this respite afforded him, he attended a course of Medical Lectures under Drs. Shipp, Kuhn and Rush, then Professor of Chemistry in the Philadelphia College. It is probable that his acquaintance with the last named teacher had commenced at an earlier period, as Dr. Rush was then Physician General to the Hospital department; but certain it is, that during his attendance on that course, he attracted the notice, and won the friendship of that illustrious man, who continued during the remainder of his life, to manifest his affection and respect by frequent correspondence with him.

He was not, however, permitted to remain in Philadelphia, then the chief and indeed the only nursing mother of Medical Science which his country afforded, sufficiently long to obtain the honors of that school; for early in the spring of 1779 he received the appointment of Surgeon, to a letter of marque then about to sail from that port. On board this vessel he made a short cruize off the coast of Virginia; when falling in with an enemy of superior metal, she was chased into the Chesapeake, and after a severe engagement was captured. As his vessel struck her colours the Doctor leaped over-board and narrowly escaped being made prisoner by swimming two miles to shore. On his return he speedily rejoined the army; but our limits will not permit us to follow his progress through the varied fortunes of that glorious contest, to its brilliant termination, and we will only observe that he continued in active service until the end of the war, an highly honored and respected officer of the Medical department.

After the cessation of hostilities he resigned his station in the army, and commenced the practice of medicine in his native country, between Annapolis and Baltimore; where the reputation

which he had procured abroad soon obtained for him an extensive business. In this situation, however, he continued but a few years; when captivated by the glowing pictures of a western paradise which then lured many of the inhabitants of the older states from their comfortable homes, to seek a residence beyond the mountains, he joined the tide of emigration, and arrived in Lexington, Kentucky, in 1790.

Here he sat himself quietly down to the business of his life; but it was not long before his country again demanded his services, in her struggle with a new and savage enemy on her borders; the appeal was not in vain, he accompanied the army on one or two expeditions against the Indians; and was appointed Surgeon General to the army commanded by General Wayne, in the decisive campaign of 1794; immediately after which a treaty was concluded which for a long time secured the safety of our border settlements: and on finally bidding farewell to a military life, he again commenced the practice of Surgery and Medicine in Lexington. He soon commanded the best practice in the State, and here for more than thirty years, with but few and short intermissions, he continued to exercise its laborious, important and responsible duties; with what success the inhabitants of this town can abundantly testify. Nor was it alone to the comparatively limited population of this place or county that Dr. Ridgely was known; his fame both as a physician and a surgeon extended itself throughout the bounds of the State, and he was consulted either in person or by letter, on many of the more important cases which presented themselves within an hundred miles.

Meanwhile he devoted no inconsiderable portion of his time, to the purposes of instruction. His shop was always thronged with pupils, and many of the most respectable practitioners of this day in the western country, and among them a distinguished teacher in the Transylvania School, are proud to acknowledge him as their preceptor. The fountains of information which he threw open to them did not so much consist in books, as actual business; not so much in the lucubrations of the study as in clinical labour. They were introduced to the bed-side of the

sick; where they were urged to watch the progress of disease, to learn its cause, to note its symptoms, to exhibit the medicines prescribed for its removal and to mark its termination; so that his pupils became instructed in the art of healing from the great source of all correct knowledge, the book of nature.

Dr. Ridgely, though by no means wealthy, was perhaps as disinterested a practitioner of medicine as ever lived. It seemed, indeed, that he devoted himself to this laborious vocation, mainly for the purpose of doing good to others, without any eye to his own emolument. Never did the poor man ask in vain for his assistance; never in the conflict with disease was his hand palsied by the selfish thought, that his exertions would be unrequited; and often have the fruits of his labours among the rich, been poured into the lap of poverty, to sooth the sorrows of the widow, and dry the orphan's tear.

From his first entering into active life, he was at all times too much engaged in the practical duties of his profession, to enjoy leisure for extensive reading, much less for any literary undertaking: nevertheless, upon the first organization of a Medical Faculty in this school, many years ago, he was appointed one of its professors, and delivered to the small class which then attended, a course of public instruction which did him much credit; a fact of peculiar interest in the annals of our University, and one which reflects much honour upon the subject of our memoir, as it proves him to have been the first who taught medicine by lecture in Western America.

Nor was it alone as an active and successful practitioner of Medicine, or as a Medical philanthropist, that Dr. Ridgely was advantageously known. In every project for ameliorating the condition of the country in general, or of this town in particular, he always co-operated and with his purse promoted, so far as his funds permitted. The success of Transylvania University was always dear to him; and for many years he served its interests faithfully in the capacity of Trustee. In this character he, aided by his departed friends and associates, the lamented Morrison, Clifford and Wilkins, and by other yet living members of the board, was eminently active in reorganizing and establishing upon a firm

basis its Medical Department, from which he confidently anticipated much benefit to Lexington, and great advantages to the Medical Science of the West. Need I say how fully these prophetic anticipations have been already realized?

Whilst thus pursuing in the evening of his days the enviable path of reputation and of usefulness, our venerable friend had the affliction, in the fall of 1822, to lose the partner of his bosom; the mental anguish arising from which bereavement, together with great corporeal infirmity, disqualified him farther from the duties of his profession: he therefore relinquished it, and on a visit to his daughter, he died at Dayton, Ohio, on the 21st day of November, 1824—"full of age and full of honor."

The extensive circle of his acquaintance and his relatives will pardon we trust, this short and very imperfect sketch of the long and useful life of their deceased friend; whilst with gratitude, the writer acknowledges himself indebted for many of the incidents which he has related, to the kindness of the venerable Pindell,* his earliest and long tried friend, and latest associate in the labours of the profession.

Dr. Ridgely was in person rather below the ordinary stature, but most symmetrically proportioned. His motions in walking were particularly graceful, and even in advanced life, he moved with a step firm and elastic. Possessing, as has been observed of Dr. Rush, "a pleasing figure and an easy address, with great affability and suavity of manners, the intelligent stranger was at first sight, prepossessed in his favour, and that favour soon grew into confirmed estimation." We have already alluded to the early intercourse, and continued correspondence, which existed between these good men; in whose public bearing and private deportment there seems, indeed, to have been a striking similitude. For of no one could it be said, with greater justice, than of the subject of our notice, as the biographer of Dr. Rush has observed of him, that "the sympathies of his heart, the kindness of his manner, and the soothing expressions which he could so

* Dr. Richard Pindell, formerly of Hagerstown, Maryland, for the last fifteen years of Lexington, Ky. who at the advanced age of seventy-two, continues to pursue his profession with activity and usefulness.

happily employ, rendered him at all times a welcome visitant at the bed of sickness, and at the house of sorrow. No man knew better than he, how important it is to unite the characters of the physician and the friend, nor could any one with more facility or a better grace effect the union."*

In reviewing the character of Dr. Ridgely, amidst that assemblage of excellencies rarely combined in the person of one individual, there were some with which he was pre-eminently endowed, and which particularly strike our attention. His unwearied assiduities in the discharge of his professional duties; his marked politeness to all persons, and especially his urbanity to brethren of the profession; his charitableness to the needy; his unrequited services to the poor; but above all, his widely extended and general benificence are worthy of our highest eulogies and our closest imitation. S.

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*Delaplaine's Repository of the Lives and Portraits of distinguished Americans. Life of Dr. Benjamin Rush, page 33, vol. I.

ART. XIII.—*Meteorological Journal from February to May, 1828.* By THOMAS J. MATTHEWS, A. M. Morrison Professor of Mathematics and Natural Philosophy, in Transylvania University.

Date.	Thermometer. 7 A. M.	1 P. M.	7 P. M.	Mean of Barometer.	Prevailing Winds.	General Remarks.
1	57½°	61½°	57°	28,959	S. W.	Cloudy.
2	60½	66½	66	28,702	S. W.	Rain, Changeable.
3	43	62	52	28,790	S. W.	Clear, some clouds.
4	48	51	46½	28,951	Calm	Cloudy.
5	49	57	52½	28,917	Calm	Cloudy.
6	53½	62½	58	28,664	S. E.	Rain.
7	52½	53	44	28,813	S. W.	Cloudy, part clear.
8	36	54½	50	29,135	S. W.	Clear, some clouds.
9	47½	52½	54	28,850	S. W.	Rain.
10	48	37½	31	28,927	West	Rain and snow.
11	28	38	34	29,277	S. W.	Clear.
12	32	42	34½	29,413	S. W.	Clear, some clouds.
13	33	48	42	29,275	S. W.	Cloudy.
14	40	46½	44	29,087	N. E.	Rain.
15	43	45	42	29,074	S. W.	Rain.
16	41	44½	37	29,152	Chang	Cloudy.
17	35½	57	49	29,005	South	Clear.
18	46	50	39	28,547	S. W.	Rain.
19	34	39½	36	28,793	S. W.	Snow, cloudy.
20	43	48	51	28,503	S. W.	Rain.
21	40	41	36	28,650	S. W.	Cloudy.
22	35	46	38	28,966	Chang	Cloudy.
23	36	52	46	29,003	Calm	Clear.
24	48	54	40	28,731	S. W.	Clear, some rain.
25	34	43	35	29,239	N. W.	Cloudy.
26	38	43	43	28,933	S. W.	Rain.
27	46	56	56	28,712	S. W.	Rain, blustering.
28	23	34	31	29,049	West	Clear.
29	30	31	31	29,069	West	Clear.
	41½°	48½°	42½°	28.868		

Depth of rain on a level for February, 6.732 inches.

Date	Thermometer. 7 A. M.	1 P. M.	7 P. M.	Mean of Barometer.	Prevailing Winds.	General Remarks.
1	23°	43°	36°	29,067	South	Cloudy, part clear.
2	40	47	44	28,614	S. W.	Cloudy, some rain.
3	32	32	29	29,030	S. W.	Cloudy, snow.
4	19	31	24	29,187	Varia.	Clear.
5	21	40	36	29,218	Calm	Clear.
6	34	53	50	29,134	South	Clear.
7	44	61	55	29,102	South	Clear.
8	49	65	57	29,072	S. W.	Cloudy.
9	48	68	56	29,112	South	Clear.
10	56	66	58	29,103	S. W.	Cloudy, rain.
11	57	62	60	28,976	Varia.	Rain.
12	50	48	44	28,864	N. W.	Rain.
13	34	50	49	28,858	Calm	Clear.
14	42	44	40	28,741	N. W.	Cloudy.
15	34	38	29	28,982	N. W.	Cloudy.
16	24	38	39	29,119	N. W.	Clear.
17	34	48	49	29,005	Calm	Clear.
18	45	52	49	28,844	Varia.	Cloudy.
19	43	58	54	29,160	S. W.	Clear.
20	44	60½	59	29,197	S. W.	Cloudy.
21	52	64	56	29,175	Varia.	Cloudy.
22	44	56	52	29,047	N. E.	Cloudy.
23	53	54	62	28,930	S. W.	Rain, clouds.
24	52	75	67	28,908	S. W.	Clear.
25	54	74	70	29,058	East	Clear.
26	65	79½	74	28,957	S. E.	Cloudy, blustering.
27	66	62	62	28,931	South	Cloudy rain.
28	54	72	66	29,046	Varia.	Clear.
29	62	64	62	28,902	S. W.	Rain.
30	47	42	43	29,001	N. W.	Rain.
31	42	50	48	29,035	S. W.	Cloudy.
	44°	55°	51°	29.012		

Mean height of Thermometer, - - - 47½°
Greatest height of Thermometer, - - - 79½°
Least height of Thermometer, - - - 19°
Mean height of Barometer, - - - 28.940 inch.
Greatest height of Barometer, - - 29.456 inch.
Least height of Barometer, - - - 28.418 inch.
Depth of rain on a level for March, - 2.126 inch.

Date.	Thermometer. 7 A. M.	3 P. M.	7 P. M.	Mean of Barometer.	Prevailing Winds.	General Remarks.
1	36°	56°	52°	29,069	S. W.	Clear.
2	44	48	46	29,061	West	Cloudy.
3	38	48	45	29,098	S. W.	Cloudy.
4	32	37	35½	29,027	S. W.	Snow.
5	32	33	28	29,051	S. W.	Snow, fruit destr.
6	27	34	33½	29,197	S. W.	Snow, and cloudy.
7	31	42	39	29,227	S. W.	Cloudy, clear P. M.
8	33	48	46	29,252	Calm	Clear.
9	38	57	52	29,160	S. W.	Clear.
10	50	64	62	29,023	S. W.	Clear, light clouds.
11	56	66	62½	28,970	S. W.	Cloudy.
12	58	71	68	28,828	S. W.	Cloudy.
13	59	62	57	28,472	Varia.	Rain.
14	40	40	42	28,805	North	Rain, cloudy.
15	39	53	49	29,065	East	Clear.
16	42	57	53	28,925	N. E.	Cloudy.
17	50	58	56	28,827	S. W.	Rain, cloudy, clear
18	52	56	51	28,927	N. E.	Cloudy, rain.
19	53	59	54	28,568	S. W.	Rain, blustering.
20	46	48	45	28,770	S. W.	Rain, cloudy.
21	40	62	56	28,999	Calm	Clear.
22	49	67	64	29,040	Calm	Clear.
23	56	75	70	28,969	South	Clear.
24	62	66	55	28,808	South	Cloudy.
25	62	63	64	28,738	South	Rain.
26	58	65	55	28,838	S. W.	Rain, cloudy, clear
27	52	65	62	28,995	S. W.	Clear.
28	51	64	60	28,988	Varia.	Cloudy.
29	58	66	64	28,934	South	Cloudy, some rain.
30	60	77	71	29,011	Calm	Clear.
	47°	57°	53°	28,954		

Mean height of Thermometer, - - - 52½°
Greatest height of Thermometer, - - - 77°
Least height of Thermometer, - - - 27°
Mean height of Barometer, - - - 28.960 inch.
Greatest height of Barometer, - - 29.260 inch.
Least height of Barometer, - - - 28.410 inch.
Quantity of rain, - - - - - 2.2442 inch.

Date.	Thermometer. Sunrise	3 P. M.	Sunset.	Mean of Barometer.	Prevailing Winds.	General Remarks.
1	68°	85°	76°	29,015	South	Cloudy.
2	69	76	67	28,952	S. W.	Rain, cloudy.
3	62	76	72	29,006	S. W.	Rain, clear.
4	66	83	74	29,024	South	Clear.
5	68	79	70	28,927	S. W.	Hail, rain.
6	64	66	60	29,000	S. W.	Rain, cloudy.
7	51	54	54	29,201	N. W.	Cloudy.
8	44	60	56	29,272	N. E.	Clear.
9	48	70	60	29,168	S. W.	Clear.
10	56	76	68	29,084	East	Clear, cloudy.
11	65	68	62	28,887	S. W.	Cloudy, rain.
12	56	59	55	28,932	South	Cloudy, rain.
13	53	63	60	28,951	S. W.	Cloudy, rain.
14	58	70	66	29,050	S. W.	Clear.
15	62	75	64	29,062	West	Clear.
16	65	78	70	28,992	S. W.	Clear.
17	64	76	66	28,939	West	Clear.
18	57	71	64	28,915	West	Clear, cloudy.
19	58	70	64	28,843	East	Cloudy.
20	60	65	60	28,828	East	Cloudy.
21	60	67	58	28,790	N. E.	Cloudy, rain.
22	54	60	53	28,810	Calm	Clear.
23	57	70	70	28,842	West	Clear.
24	68	76	70	28,845	West	Clear.
25	62	74	66	28,805	West	Rain, cloudy.
26	68	79	58	28,780	S. W.	Cloudy, rain.
27	48	64	55	29,090	Varia.	Rain, clear.
28	56	66	64	29,028	Calm	Clear.
29	65	72	66	28,777	S. W.	Cloudy, rain.
30	63	69	64	28,807	West	Cloudy, clear.
31	58	72	62	28,965	West	Clear.
	59°	69°	63°	28,954		

Mean height of Thermometer,	65°
Greatest height of Thermometer,	85°
Least height of Thermometer,	44°
Mean height of Barometer,	28,954 inch.
Greatest height of Barometer,	29,275 inch.
Least height of Barometer,	28,720 inch.
Quantity of Rain,	4,8032 inch.

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PROPOSED WESTERN PUBLICATIONS ON NATURAL HISTORY.

We are much gratified to learn the intention of those able naturalists, Messrs. Maclure, Say and Lesueur, to publish at New Harmony, Indiana, the following works.

1. *A Work on the Fishes of America, by Mr. Lesueur*, with 4 coloured plates in each number; at 40 cents. per number.
2. *A Work on American Shells, by Mr. Say*, with 10 coloured plates in each number, at $1.00 per number..
3. *Michaux's Sylva Americana;* the proposals for the republication of which are thus announced by Mr. Maclure.

"Before I left Europe, I found that a London book-seller was on the point of purchasing the whole edition of MICHAUX'S SYLVA AMERICANA from that author, with all the copper-plates, which having only struck off about two or three hundred copies, are as good as new. I interfered, and bought the whole, because I thought it a stock-book that ought to be in all our libraries, as the only register of the greatest part of our forest trees; for after the cutting down of our woods, the most useful only will be left in preservation. And likewise, from the expense of publishing a new work, it is probable we shall never have another so perfect, of which the London book-seller, taking the advantage of his monopoly, would have made us pay dear; for, even when the work was in the hands of the author, the London price was 10 guineas per copy.

Being in possession of all the copper-plates, capable of printing thousands of copies—it is proposed to publish a new edition by subscription, in Nos. of five plates, coloured after nature, at *one dollar per No.* It is further intended, to add a number of trees, omitted by Michaux, to make the work more complete—and to begin the publication when one hundred subscribers shall be obtained.

Letters addressed to the editor of Michaux's Sylva Americana, New-Harmony, Indiana, (post paid) with the names of them that wish to become subscribers, will be attended to. Agents will be appointed at the different places, when it shall be ascertained that the number of subscribers will warrant the publication.

The SYLVA AMERICANA, of Michaux, is not only an accurate botanical description of our forest trees, but contains considerable information on the nature and quality of their wood, localities, mode of cultivation, and uses they are put to, in the different States of the Union.

[*New Harmony Disseminator.*]

JUST PUBLISHED at Boston, Mass. and will be ready for subscribers in the Western country, in the course of a few weeks, MEMOIRS OF THE LIFE OF THE REV. HORACE HOLLEY, L. L. D. late President of Transylvania University. By CHARLES CALDWELL, M. D. Professor of the Institutes of Medicine and Clinical Practice in that Institution.

The success which these memoirs have met with, in the Atlantic States, has already rendered a second edition necessary to supply the demand.

THE

TRANSYLVANIA JOURNAL

OF

MEDICINE

AND THE ASSOCIATE SCIENCES.

EDITED BY

JOHN ESTEN COOKE, M. D.

Professor of the Theory and Practice of Medicine in Transylvania University.

AND

CHARLES WILKINS SHORT, M. D.

Professor of Materia Medica and Medical Botany in the same Institution.

VOL. I.

LEXINGTON, KENTUCKY.

PRINTED QUARTERLY, BY JOSEPH G. NORWOOD.

1828.

UNITED STATES OF AMERICA, } TO WIT.
DISTRICT OF KENTUCKY. }

BE it remembered, that on the third day of November, in the year of our Lord, one thousand eight hundred and twenty-eight, and in the fifty-third year of the Independence of the United States, JOHN E. COOKE, and CHARLES W. SHORT, of the said District, have deposited in this office the title of a book, the right whereof they claim as proprietors, to wit:

"The Transylvania Journal of Medicine and the associate sciences: edit-
" ed by John Esten Cooke, M. D. Professor of the Theory and Practice of
" Medicine in Transylvania University, and Charles Wilkins Short, M. D. Pro-
" fessor of Materia Medica and Medical Botany in the same institution."

In conformity to the act of the Congress of the United States, entitled "An act for the encouragement of learning, by securing the copies of maps, charts and books, to the authors and proprietors of such copies, during the times therein mentioned." And also the act entitled "An act supplementary to the act entitled "An act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies, during the times therein mentioned, and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints."

JOHN H. HANNA, Clerk of the District of Kentucky.

MISCELLANEOUS NOTICES.

1. In bringing to a close the first volume of the Transylvania Journal of Medicine, &c. the editors beg leave to express to those gentlemen who have favoured them with communications, their grateful acknowledgements; and to tender to their friends generally, sincere thanks for the very liberal support and encouragement which their labours have met with.

At the commencement of an undertaking of the kind—new to the editors—to the place, and the public—much solicitude was naturally entertained as to its execution and success: the year's experience, however, has abundantly satisfied its conductors, that a periodical of the kind can and will be here sustained, both in contributions of matter and of money. The safety of the first of these inferences is fully assured by the fact that since the very commencement of the work, our printers have never been without *copy* before them; and for the last we would refer to our subscription list, which, already larger than sufficient to defray the expences of publication, is still daily increasing.

Under encouraging prospects of this kind the editors cherish the hope, that, from thn continued aid of their friends, and the experience acquired by themselves, the ensuing volume, in point of intellectual matter, will not only come up to the expectations created by the first, but that in respect to uniformity of appearance, and mechanical execution it shall exceed it.

2. We have given insertion in the present number to an address delivered by Dr. Woods at his late inauguration to the presidency of Transylvania University. This, although not strictly medical matter, we are confident will be read with pleasure by our subscribers generally—with peculiar interest by the friends and alumni of Transylvania; and that the views and sentiments set forth in it will be cordially reciprocated by the friends of Science and Literature every where. It affords us much pleasure to add that since President Woods has commenced his labours in the University, pupils are thronging to it; and that under his administration, and by the aid of his associates, its academical department will soon be in a most flourishing condition.

3. The friends of our Medical School will be pleased to learn that the prospects of a respectable and numerous class, for the present session

are highly flattering. Already a larger number of students have arrived from some of the southern states than have ever, heretofore, belonged to one class. A catalogue will probably be published during the term, in which case a copy will be sent to each subscriber to this Journal.

4. Several communications have been forwarded to us anonymously for insertion. To the contributors of these we beg permission to say that we can give publicity to nothing, the writer of which is not known to us, and whose name we are not at liberty, (if necessary,) of giving to the public.

5. Our correspondents would render us a favour by writing their communications on thin foolscap or letter-paper. Owing to the neglect of this, the postage, (which on written documents is rated by their weight,) on two papers of the present number has cost us $10.

6. Communications intended for the 5th number, or 1st number of the 2d volume, which will be published punctually on the 1st of February, should be before us by the middle of December.

7. The Editors of the Transylvania Journal have it in contemplation to address a circular to the editors and proprietors of all similar periodical Journals in the Union, inviting them to join in a united appeal to Congress to reduce the postage on such journals to the same rate, per sheet, with that of news-papers. They see no reason whatever why quarterly or monthly publications on Law, Theology, Medicine or general Literature should be taxed with a postage double of that which is paid by daily and weekly news-papers.

8. We have been at very great expence in conducting this journal for the past year, and therefore hope that those gentlemen who have not paid their subscription will attend to it immediately. We are aware that the sum of three dollars is in some parts of the country not a very convenient one to remit. It is, however, always in the power of two or three subscribers to unite in a remittance. Two who wish to subscribe can unite in sending $5, and leave the balance to be paid at another time. Three can unite in remitting $10, and the balance of one dollar can be put to their credit for another year. Those who now owe four dollars, in consequence of deferring payment till the the close of the year, can send five and be credited by the remainder. To meet the current and continually recurring expenses of such a work, we would prefer being kept in funds by the payment of three dollars at the commencement, to four at the end of the year.

ERRATA.

Page 164, 12th line from the bottom; for *in* that, read *on* that.
" 165, 6th " " " for *uninformed*, read *unformed*.
" 321, 10th " " " for *possessors*, read *professors*.
" 322, 8th " " top, for *adopted*, read *adapted*.
" 398, 7th " " bottom, for *such does* read *such doses*.
" 440, 9th " " top, for *Shipp*, read *Shippen*.
" 446, 15th " " " for *they are*, read *it is*.
" 462, 19th " " " for *Chaupier*, read *Chaussier*.
" 479, 7th " " bottom, for *nerve* read *vein*.
" 482, 8th " " top, for *external* read *extreme*.
" 583, 9th " " " for *Beaufre* read *Beaupre*, and the same wherever the name occurs.
" 550, 3d " " bottom, for *exery* read *every*.

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A succinct account of the symptoms arising from a poisonous quantity of the narcotic under consideration, cannot be regarded as unessential or out of place, notwithstanding it has been affirmed that they "can hardly be mistaken by the youngest tyro."

These phenomena are of two different and diametrically opposite characters. Always when a moderate dose has been exhibited, an evident and pretty sudden excitation in the functions of the living economy is developed; and if it has not been too large, this state continues for an indefinite length of time, and eventually the system returns to its natural grade of action, without having sustained any diminution of vital energy. On the contrary, however, when a dose deleterious in its character has been administered, the state of excitement just alluded to is not so manifest, so fully developed, nor is the period of its continuance near so protracted; for rapidly merging into a state of exhaustion, the life of the individual is placed in a situation of peril which cannot always be averted.

The primary action of a moderate dose of this celebrated

oriental luxury, is that of a potent diffusible stimulant; it awakens to unwonted exertion the cerebral organs, imparting to their functions activity and energy, and producing a state of mind which makes it shrink from the vastness of its own conceptions. The increased force and frequency of the pulse, denotes the excited state of the vascular system, and the strength, promptitude and temporary vigour felt in all the voluntary exertions of the body, reveal that of the nervous. These symptoms, however, are only temporary when an adequate quantity of the narcotic has been swallowed. The vascular system not only sinks to its natural standard, but the heart becomes slower, fuller, and softer in its pulsations; it labours and appears very much encumbered with an overcharge of blood. The mind parts with its brilliancy and becomes dull and languid, and sometimes unsettled, incoherent and stupid, or delirious. Respiration is slow, difficult, embarrassed and finally it is sonorous rather than apoplectic. The powers of life generally are depressed; the voluntary motions are performed with less freedom; all the secretions except those of the skin are diminished, or suspended; sensibility is almost extinguished; vision is indistinct, and the eyes are injected and have the appearance of inflammation. Profound, heavy, lethargic sleep now follows and suspends every conscious power; a cold, livid, cadaverous insensibility extends its empire over every part; the pulse is no longer sensible, and death drops the curtain over the dark prospects of the afflicted suicide, in from eight to twenty-four hours from the time the fatal potion was swallowed.

Autopsic appearances. Those who have fallen victims to the destructive agency of opium, generally swell to an immense size in a few hours after dissolution; the body soon exhales a repulsive putrefactive odour, and the superficies becomes the seat of numerous dark, livid, gangrenous spots. On dissection, the viscera are usually found unaltered in character; the veins are engorged with an extremely fluid blood, and the arteries are empty. Sometimes, the brain and its meninges are distended with a very black blood; sometimes the liver and spleen are overload-

ed; the stomach and intestines swollen and injected; but the bladder and kidnies are commonly sound.

Modus Agendi of Opium. The operation of opium, in the extinguishment of life, next comes under consideration; and though most toxicologists agree that this event results from the destruction of the cerebral functions, in consequence of which, the respiratory organs cease to perform their office; yet the manner in which, or the medium through which this is effected, has been a point of interminable doubt, and still remains like all disputed questions, *sub judice.*

It is possible that it makes its poisonous impression directly upon the sentient extremities of the nerves, and from thence affects sympathetically the brain; though I confess I am unwilling to rank myself among those who espouse this doctrine. Nor am I more satisfied with those physiologists, who assert that the poison is taken into the circulation and placed in immediate contact with the brain. It is a fact of considerable celebrity that when the brain, or a nerve, is exposed to the direct action of opium, no impression is produced: consequently we are not warranted in affirming that either of the processes above alluded to, is adopted by nature, in destroying the sensorial or vital energies; for whether we suppose it to act directly upon the sentient extremities of the nerves, or to be absorbed into the blood, and in the general round of the circulation applied to the brain, the individual should escape with impunity; for that organ not being susceptible of receiving an impression, no deleterious effect should be produced. The contradiction discoverable in these hypotheses, and especially in the latter, can only be reconciled by supposing the drug to be more innoxious, when directly brought in contact with the medullary substance of the encephalon, than when it reaches it through the great channel of the circulation. An additional difficulty, however, would present itself, for there is a barrier to overcome before it can even reach the blood, a necessary step previous to its acting upon the brain. The organic sensibility of the absorbent vessels of the part must be so blunted or changed in its character, as to enable

them to admit it, and there is as good reason to suppose that the rapid exhaustion of the vital principle which soon succeeds, is as much, and in my opinion more, owing to the radical alteration which their sensibility must unavoidably sustain, as to the apoplectic impression which, according to some, is always made upon the brain. On the subject of this apoplectic condition of the encephalon, more has been received as true, than has been proved; for if we candidly and fairly investigate the evidence, we shall come to the unavoidable conclusion that the supposition is gratuitous and unsustained by a single fact. Thus it is positively asserted by Sauvages, that an over-dose of opium produces carus and not genuine apoplexy. The former complaint is distinguished from the latter by the absence of stertor, and we are well aware that something similar to this kind of breathing is sometimes observed in poisoning from opium, but not so strongly resembling it as to identify them; in the latter, it has a more sonorous than a stertorous character. Reflection upon this point induced me to perform the subjoined experiment. I trephined a large full grown dog, bled him till his life was endangered, and then injected into his external jugular vein, one drachm of laudanum. In thirty-five minutes he expired; but the encephalon, so far from being found in an apoplectic state, did not labour under more sanguineous plenitude, I will not say distention, than the lungs, liver or spleen; and did not contain of course its natural quantity of blood. Furthermore, I may observe that it is asserted by Monro, that the cranium is a plenum, and that the brain like water is in a great measure incompressible, and consequently that the brain can never be overcharged with blood, except at the expense, or rather from the expulsion of a quantity of serous or other fluids, from the cavity of the cranium equivalent to the overplus of blood received. It is stated also by others, and I know the fact myself from actual experiment, that the brain cannot be depleted like another organ, unless the air is permitted by trepanning the skull, to press upon it. I therefore, performed this operation upon the animal alluded to, that the brain might be placed upon a footing with the other organs, and that it might undergo the same alteration, when

ance with any one of them, to be derived from *ex professo* publications, and do not, therefore, in our humble opinion, deserve exclusive confidence. The impropriety of restricting our researches to those garbled abstracts, and imperfect accounts of poisonous articles, frequently found appended to works on the practice of medicine, is too manifest to justify the briefest comment. We shall, therefore, without pausing to apologize, treat somewhat *in extenso* poisoning by opium: for being an article whose eminently deleterious properties have strongly recommended it to the suicide, sometimes to the assassin; and accident or ignorance having frequently put to the test the toxicological address, skill and knowledge of the physician, a thorough acquaintance with the manner in which its poisonous properties are disclosed, and the most prompt and efficient means of arresting its progress and of rescuing the individual from a most perilous situation, should constitute no small portion of the medical, as well as the forensic attainments of a practitioner of physic.

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ther the limits nor the character of this memoir, will permit me to enter into detail. In another paper on the subject of the "*Absorbent System and its Functions*," which in all probability I shall put to the press during the present year, the premises here assumed shall be proved if possible, to the satisfaction of every impartial reader.

The animal body is a vascular tissue, and this tissue is exclusively absorbent in its character. Independently of those absorbent vessels, commonly denominated lymphatic, the true absorbent system comprehends a class of vessels, which arise from the parietes of the capillary arteries, and terminate in the interior of the viscera, and upon all the internal and external surfaces; and a second portion of the same class, which originate from all the points in which the first terminate and terminate in the capillary veins. The former are denominated for reasons satisfactory to myself, arterial absorbo-exhalents; and the latter, venous absorbo-exhalents: the former are the instruments of nutrition, of all the secretions and of all the exhalations; the latter remove from the body all those parts that from age or other causes, become unfit for the uses of the system. These vessels are eminently endowed with vital properties, and among the most distinguished of these may be ranked the organic sensibility of Bichat, or the elective sensibility of other authors, in virtue of which, they appropriate when in their normal state those materials only that are well calculated to subserve the purposes of the body, but when it becomes abnormal they make use of such as disturb the integrity of the vital functions and necessarily produce disease.

These physiological preliminaries having been settled, we shall direct our attention more immediately to the modus operandi of opium; when the connexion which the former has with the latter, will be readily discovered.

It is not absolutely necessary for opium to be introduced into the stomach, in order for its deleterious influence to be participated by the body at large; for Sauvages informs us, that *carus a narcoticis* is occasioned either when it is taken by the mouth or in the form of glyster; or as Dr. Bouillet asserts, when ap-

plied in the form of liniment to the chest; or according to Mr. Brodie, when it acts through the respiratory organs. These are the only parts to which the drug can readily obtain access, and when applied to these various parts, the slight difference in effect is exclusively owing to the quantity and strength of the article. Thus we are naturally led by this singular circumstance to inquire, what is the tissue pervading these different parts upon which it immediately acts. Although nervous filaments are found in considerable abundance, distributed through the parts just alluded to, we cannot reasonably select them as the medium through which the narcotic produces its characteristic effect; since what has already been advanced, must render that idea sufficiently improbable. The absorbent tissue then, is the only rational alternative left, and I think we shall be able conclusively to evince, that they are the only organs fitted for the purpose. I shall not pause to prove that it abounds in the textures upon which opium makes its primary impression, that must be granted—being a postulatum to be proved at another time.

That absorption is the only channel through which medicines reach the circulation, every well informed therapeutist will without hesitation admit, and that they do sometimes find their way into the blood, the testimony of almost every individual who "has at all kept pace with the progress of our science," most conclusively evinces. This is true of medicines in general, and according to M. Barreuil of opium in particular. He informs us that he analized the blood of a young gentleman under the care of Drs. Ollivier and Marye, who had taken an ounce and a half of laudanum, and proved the existence of morphine in that fluid. It is very certain that opium injected into the veins, produces nearly the same effects as when introduced into the stomach, a strong argument in favour of its absorption. If it acted upon the sentient nervous extremities, the phenomena produced should be nervous in their character, and not so exclusively vascular as they are known to be in the commencement. In those experiments, moreover, in which the brain and spinal marrow were destroyed, and the opium still developed

its characteristic effect, the drug must have been unavoidably absorbed. This idea is sustained by the fact, that the absorbents, as we are assured by Mr. Gutherie, continue to carry on their functions, quite regularly, in an extremity which has lost sensation and motion, in consequence of the division of a nerve: he, therefore, supposes that the absorbent system is in a great measure independent of the nerves. The circumstance already quoted from Sir Astley Cooper, shews manifestly, that the involuntary functions may proceed in parts cut off from their connexion with the brain and spinal marrow. We are assured moreover, by Nysteron and Orfila, that laudanum acts most energetically when injected into the cellular texture of the body. Now, it is a fact familiar to every microscopic anatomist, that this tissue not only abounds with, but is almost exclusively made up of absorbent vessels, while at the same time, there is a great paucity of nerves. From among the multitude of facts that press upon me, I cannot select one from higher authority, or more forcible and conclusive in its character, than one from Prof. Chaupier. He confined a urinary calculus in the cellular tissue of a living animal, which totally disappeared some time after its insertion. Were additional evidence of the absorbent character of this tissue necessary, it might be adduced in the greatest abundance from the works of Cruikshank, Hunter, Mascagni and Desgenettes. Thus, I think, the liberal and catholic therapeutist is not permitted to cherish a doubt about the organ or tissue, upon which opium makes its deleterious impression.

Having more fully perhaps than was absolutely necessary, exhibited the evidence in favour of the absorption of opium, it behooves us to endeavour to explain, upon the principles of the absorbent system, how its poisonous influence is extended over the body.

With the excellent Barbier, I am apt to conclude, that every active medicinal agent should be viewed in the same light that we contemplate a cause of disease: they are identically the same in essence; they are inimical to the real interests of life, for neither can enter the body without disturbing its tranquility. The effects which proceed from the former, may be compared

to the symptoms which arise from the latter, and which result from the reaction of the natural powers. If this be true, and if they owe their virtues to this circumstance, it is but rational to suppose that they pervade the same channel in reaching the general system, in order to produce the changes necessary to a restoration of health, which morbific causes do to excite disease. Thus we know, that the variolous virus being introduced into a part, a new morbid action is instituted, which spreading through the instrumentality of the absorbents to every part of the body; that which was before beautiful and fair, becomes a repulsive mass of corruption. Opium in like manner, acting upon a particular organ, impairs, blunts, and eventually extinguishes the elective sensibility of its absorbents: and in consequence of the close union which exists between the absorbent tissue in the most remote parts, and that primarily impressed, the same alteration in their elective sensibility is universally realized. When the quantity taken has been sufficient to endanger life, that particular alteration which ensues, amounts almost to an extinguishment of it. This is clearly evinced by the state of the secretions and the activity of absorption, the healthy state of both of which functions depends almost exclusively upon the normal condition of the elective sensibility. Thus the arterial absorbo-exhalents pour out a thin watery perspiration in such abundance, that one would suppose that it flowed unobstructed through mechanical or inorganic pores, rather than from vessels richly endowed with vitality, while all the other secretions are totally suspended. Absorption is morbidly increased, and opium is known powerfully to excite it. This is evinced by the immense amount of perspirable matter separated from the blood, absorbed from the capillary arteries and poured out upon the surface. These phenomena exhibit an extremely relaxed condition of the vessels of the skin, and that this is owing to a change in their elective sensibility, and a great expenditure of their irritability, the following experiment, performed by Mr. Charles Bell, most clearly proves. He tells us, that if a glass tube be attached to an artery of a horse, the blood will rise in the exact ratio of the vigour of the circulation; if bled from

another vessel, the blood will descend in the tube when the circulation is slow and feeble, and when the animal is exhausted and dying, the surface will break out in abundant perspiration. Thus we observe from the agency of two different causes identically the same change wrought in the vital properties just alluded to, and the same result produced.

It appears to me, that this relaxed or patulous condition of the absorbents (I use the word generically,) is first manifested in the lungs; for when a dangerous dose of the narcotic has been exhibited, the symptoms that disclose it arise from the respiratory organs. Thus, before any other dangerous signs are developed we observe a laborious and very difficult respiration: an immense quantity of fluids, part mucus, part phlegm. and part saliva, flowing from the mouth. These phenomena I would explain thus: the absorbents of the lungs participating readily in the action of the remote part, upon which the opium primarily acted, they in common with the skin exhale a morbid quantity of liquids: this at once supposes the existence of the patulous state of which we have just spoken, and which would necessarily prevent the venous absorbo-exhalents, in a great measure deprived of their elective sensibility, from exercising that nice tact in selecting vital air, which they are accustomed to in a state of health. Consequently, they would permit air unelaborated by any vital process to enter with comparative freedom and mingle mechanically with the blood. The imperfect vitalization of the blood is evinced by the livor of the face, hands and other parts. That this mechanical mixture is fact and not fancy, I think we should be convinced by the frothy and grumous appearance of the blood detracted. I have frequently witnessed this attribute of this fluid, but never except when there was some pulmonary disease.

The exhausted state of the arterial absorbo-exhalents to which we have just alluded, I have usually observed next to make its appearance throughout the alimentary canal. This is evinced by the increased amount of thin watery phlegm found in the stomach, and by the loose character of the stools. Indeed this latter feature is so remarkable that I never exhibited to a dog

a large dose of opium, but he invariably and in a very short time, had an alvine evacuation of a peculiarly smooth and oily aspect.

The next in succession are the cutaneous phenomena which I have already amply noticed.

The same inorganic condition (if I may be allowed the expression,) of the arterial absorbo-exhalents, is now developed in the meninges of the brain, as is manifestly shown by the case of Mr. Stanley recorded in the Transactions of the London College of Physicians: water was formed in the cellular tissue of the pia mater, covering the greater part of the cerebrum, but in other respects the brain had no unusual appearance. The case of Mr. Cornish related in the London Med. and Phys. Journal which demonstrated the existence of a considerable quantity more of fluid in the lateral ventricles than natural, is little less conclusive. This unnatural state of the cranial contents is certainly sufficient to account for the wandering of the intellectual faculties, their great dulness and hebetude; the deep lethargic sleep and coma.

There is also in many instances, particularly in dogs a watery and injected condition of the eyes, a peculiar and excessive lachrymation which readily explains those sparkling scintillations, dark floating specks, vertigo and temporary blindness, of which the patient frequently complains. Thus, the absorbent tissue, uniting all its parts in the closest manner by continuity and contiguity of situation, by identity of structure and by a perfect similarity of vital properties, when one part has been impressed, the whole feels the change which has taken place, and therefore acts with a proportionate harmony and concord. Besides, no other tissue is capable of acting thus, no one is capable of bringing under such immediate influence the entire system; for, communicating at every external point of the system with foreign bodies, it is impossible for opium to come in contact with it, without imparting to it its deleterious influence. Pervading also the deepest recesses of the most delicate textures, it is the only channel through which the original baneful effect can be transmitted.

The absorbent system entering as the most important element into the structure of every tissue, I cannot conceive the necessity there is for supposing that opium is carried into the circulation and then makes a specific impression upon the brain. The brain, it is true, in common with every other part, is impaired in its functions, but this doubtless proceeds from the great alteration which has taken place in the minute vessels of its membranes; and the latter arises from their participation in the action of the part upon which the narcotic originally made its impression. This distant participation, does not, from what has been already urged, depend upon the agency of the nerves, and I am satisfied it does not depend upon the blood. Thus, Fontana and Monro cut out the hearts of twenty-four frogs, and injected a solution of opium into the stomach of some, and abdomen of others: death ensued in proportion to the strength of the poison. The difference in the time of dissolution corresponding exactly with the strength of the solution, we are compelled to admit that the opium produced a deleterious impression somewhere; that it did not upon the blood, is clear from the absence of the heart; that it did not upon the brain, spinal marrow, or nerves, experiments already quoted evidently prove. The absorbent system then, is the dernier alternative, and I cannot refrain from confidently declaring my belief in the opinion, that opium destroys life by impairing organic sensibility until it is entirely extinguished, and wearing away the irritability of the same system till it is entirely exhausted.

Treatment. The treatment of poisoning has been almost exclusively empirical. No settled principles have been hitherto established: practitioners have simply recommended remedies without attempting to ascertain the principle upon which they act, or the particular state of the system which requires them, and which favours their salutary operation. Thus, their boasted antidotes or specifics have so frequently failed of success, that little confidence is placed in them. This course of inconsistency shall be avoided if possible: we shall endeavour to regulate our practice upon certain ascertained and satisfactory principles.

Emetics. Among the most conspicuous for their efficacy, eme-

tics stand in the foremost rank. If spontaneous vomiting takes place, it should not be interrupted; and while no means are employed to arrest it, mucilaginous diluents should not be given to promote it, as has been recommended in a late work by Dr. Best; for they certainly are contraindicated and should be positively interdicted, as they dissolve the opium and promote absorption. If vomiting has not already taken place, and the physician should arrive before the system has suffered much, ipecacuana, tartarized antimony, sulphate of zinc or copper may be administered. The smaller the quantity of diluent used as a vehicle the better. As there is usually great gastric insensibility, where spontaneous vomiting has not taken place, perhaps it would be more judicious not to consume time with the two former; but have recourse to the two latter immediately. Being more active, they will be more apt to accomplish the object in view. It is only soon after the narcotic has been administered that vomiting can prove serviceable, and should not therefore be resorted to after any peculiar or dangerous symptoms have been excited; for it can have no agency in removing the poisonous impression that has been made, and might also produce dangerous determination to the head. Emetics, moreover, are powerful promoters of absorption, and cannot be otherwise than injurious if had recourse to after the period has elapsed, when the poison might have been removed from the stomach, before any effect has been produced upon the system.

When the patient is incapable of swallowing, an emetic solution may be injected into the œsophagus from the right nostril; or a scruple or half a drachm of tartarized antimony, may be dissolved in a little water and thrown into the bowels and in that way excite vomiting; or as a last, and perhaps desperate alternative, half a grain of the same medicine may be dissolved in two ounces of warm water and very slowly injected into a vein. This will rarely fail to invert the action of the stomach. To all these modes, I am directly opposed, as they are never had recourse to until it is too late for them to be of any benefit, and then they are exposed to all the objections urged against vomiting when not pretty soon excited.

Blood-Letting. To promote vomiting and to shield the viscera from what is called congestion, blood-letting *ad deliquium animi* has been commended by Rush and Orfila. It is a remedy, however, which excites the absorbents to unwonted vigour, at a time when the total suspension of their functions would be most conducive to the real interests of the patient. For this reason I have uniformly abstained from the remedy, except in one instance, when I am sure that if absolute injury was not done, no sensible benefit was derived. To ascertain how far this remedy would contribute to prolong life, I injected into the cellular texture of the thigh of two dogs, an ounce of liquid laudanum. From one I detracted at two bleedings thirty-two ounces of blood; the other was left to the deadly action of the poison, and survived twenty-five minutes the longest.

Stomach Tube. The stomach tube, originally suggested by Boerhaave, and since employed by Renault, is admirably adapted to remove the poison from the stomach in those cases in which there is great gastric insensibility. Like emetics, however, its usefulness is confined to a very early period, as I am inclined to believe, not much benefit will be derived from its employment after the system is seriously affected.

Coffee. This article when prepared in the form of strong decoction or infusion, is said rapidly to moderate the symptoms. It is objectionable, however, on account of its tendency to dissolve the opium and thus favour its introduction into the system. But in the absence of this objection, I am inclined to think, that its power over the symptoms arising from poisoning by opium quite problematical; for although I am unprepared to speak positively, I feel persuaded that I have seen enough in a single instance to induce me to pause and doubt. Very early in my professional career, I was in attendance upon an old gentleman who laboured under a most violent attack of cholera morbus, in company with two other individuals, more experienced and more deeply skilled in the art than myself, and who assumed almost exclusively the management of the case. After mercurials, the warm bath, and some other remedies had been employed without making much impression upon the disease, recourse was

had to laudanum mixed with a strong decoction of coffee. Both of these articles, to a very considerable amount were exhibited and eventually succeeded in arresting the evacuations. The old man however died, and I was induced to believe from the symptoms developed, that he owed his death as much, if not more, to the agency of the narcotic, as to the disease his physicians were summoned to cure. Some time before dissolution his breathing was difficult and sonorous; his mind was dull; he was lethargic, much disposed to sleep, and at length sunk into deep coma; the surface of his body *a capite ad calcem* was bedewed with a heavy, copious and exhausting perspiration.

If coffee has any tendency to check the evil effects arising from a large dose of opium, it should have been displayed in this instance, as it was administered in conjunction with it and had the fairest opportunity of supplanting its impression. That such was not the fact the symptoms that preceded death strikingly indicate.

Acids. Medicines of this kind, and especially vinegar, are objectionable, and for the same reason assigned when speaking of coffee and other diluents. They accelerate the solution of the active principle of opium and thus augment its deleterious energy.

Cold Water. This is the last remedy of reputation that merits particular notice, and will of course be the subject of our concluding therapeutic remarks. Entertaining as I do, the most exalted opinion of its efficacy, I shall be pardoned when I assert that of all the remedies enumerated, it is the only one that deserves confidence; the only one that can be viewed in the light of a certain, I had almost said infallible antidote, for poisoning by opium. The importance of the remedy, its comparatively recent introduction into intoxicological practice, and the commendation I have it in my power to give it, from a clinical as well as experimental knowledge of its virtue, will form an ample excuse for entering into pretty minute details on this subject. Likewise, as no physician, however great may be the range of his practice and long his experience, can ever acquire a very extensive practical knowledge of its efficacy, though suicide

assumes sometimes in certain countries an epidemic prevalence, I shall be consulting the interests of the reader by giving him an abstract of those cases in which it has been employed. This is particularly necessary, as no individual has attempted to embody in a condensed form all the evidence in its behalf.

The earliest notice we can find of its therapeutic application as an auxiliary antidote for poisoning by opium, is by Porta of Rome. In the journal of Leroux, he states that by the employment of cold water in the form of beverage, glyster, and of fomentation to the abdomen, he succeeded in curing a lady who had taken by mistake, three ounces of the decoction of opium. By Mr. Dunlop, cold affusions were employed as early as the year 1816, but in conjunction with so many other remedies that the precise amount of benefit derived from them cannot be estimated. The patient recovered. The cases which have attracted most attention were treated by Mr. Wray, and are recorded in the London Medical Repository. The subjoined is an abstract of them.

Case 1st. This case occurred in 1821: the subject was a female; she had taken two ounces of laudanum, and when visited by Mr. Wray, was in profound stupor. After many ineffectual efforts to rouse her from her lethargy, recourse was had to cold affusions. A quart basinful of cold-water was thrown upon her head and chest; the first application roused her, and in ten minutes she spoke. The remedy was repeated whenever drowsiness came on, together with some others of a trivial character. The next day she was well.

Case 2d. In 1821, a gentleman took two ounces and a half of laudanum. The usual remedies failed to relieve him. When cold affusions were employed, he was in a state of perfect stupor from which he could not be roused. A few applications had the effect of removing completely the profound stupor and the other alarming symptoms. He recovered.

Case 3rd. In 1822, a delicate young woman took two ounces of laudanum, and was nearly dead before the remedy was administered. No species of irritation would rouse her; the pupils were dilated and quite insensible; the pulse could occasionally

be felt in slight undulations, and the body possessed a considerable degree of warmth. The cold water immediately produced an evident twitching in the muscles of the face; in a few seconds she uttered a lamentable scream, much resembling that of a person recovering from suspended animation from immersion. She frequently relapsed into a state of inanimation, but was as often restored by the reapplication of the remedy. In about three hours from the commencement of the treatment, the pulse acquired greater force, and her appearance altogether showed an evident return of the powers of life. By constant attention during six hours, she was so far restored as to be allowed a few hours repose.

Case 4th. The preceding cases induced Dr. Jackson in 1824 to make trial of the remedy. The following is an abstract of the case as published in the Phil. Med. and Phys. Journal.

This patient was a female, and had taken two ounces of laudanum. Before remedies of any kind were used she was perfectly insensible, and could not be roused from the profound coma into which she had sunk. The affusions were forcibly applied but the first were not felt. The fourth occasioned a slight sobbing, which increased with each succeeding dash, until it augmented into loud cries. In less than five minutes she was able to sit up, and was partly conscious of what was addressed to her: with very slight resistance her mouth was opened, though her jaws previous to the employment of the remedy, had been firmly fixed by the contraction of the muscles. He still continued the occasional exhibition of the affusions, for some time longer, and his patient rapidly improved under them; and with the assistance of a few unimportant agents she entirely recovered.

Case 5th. This case occurred in 1821; and was not published until 1824. The reasons why I postponed its publication are given in the Phil. Med. and Phys. Journal, from which the present abstract is taken. The subject of this case was a female and a prostitute. "When we arrived, she was insensible to all stimuli; the pupil did not contract when subjected to strong light; the olfactories were insensible to the most pungent sternutatories; and the skin seemed entirely devoid of sensibility. She

foamed copiously at the mouth; her jaws were almost immoveably locked; the flexors of the fore-arm were in a state of continual subsultus; the skin was cooler than in the healthy state, and covered with a cold clammy sweat." When every remedy had entirely failed, recourse was had to cold affusions. Large buckets of cold water were thrown upon her head, but it was forty minutes before a return of sensibility became manifest: in an hour more she could articulate distinctly, and continued progressively to recover till she was entirely restored to health.

Case 6th. Dr. Crampton, of Ireland, records a case from personal observation in which two ounces of laudanum had been taken, and an hour and a half elapsed before cold water was used. The remedy, however, was entirely successful.

Case 7th. Professor Alison treated a case of poisoning by opium in 1825. The stomach tube was first employed but with little advantage; the livid flushing of the face, sonorous breathing and general destitution of sensibility still continued. The patient was then stripped naked, and cold water dashed over his head and shoulders. By this he was powerfully excited, sprang from his seat, and fell forward, gasping strongly and repeatedly, and when raised, opened his eyes, and looked wildly around him. The patient recovered, and though the advantage derived from the cold affusions was prompt and manifest, yet he was near losing his life, by suspending the remedy too soon, and by suffering him to sleep too much.

Case 8th. The case of Dr. Staats, of Albany, occurred in 1824, and is recorded in the New-York Medical and Physical Journal. The subject of it was a mulatto fellow: he took three drachms of solid opium, and when found was lying in a stupified state, perfectly insensible. "His breathing was stertorous and oppressed, with every appearance of approaching apoplexy." Several remedies were employed without decided advantage, after which cold affusions were exhibited and continued for the space of fifteen minutes, when he opened his eyes, and appeared sensible; but immediately on withholding the water, he fell asleep. The remedy was repeated, with the same effect; and by the constant application of it at intervals of a few minutes,

for the space of six hours, the patient was rescued from a premature death.

Case 9th. This case, recorded by Dr. John B. Beck, in the same journal, beautifully illustrates the efficacy of cold water. The subject of it was an infant two months old to whom its mother gave twelve drops of laudanum instead of paregoric. The mistake was soon discovered, and an apothecary attempted ineffectually to excite vomiting by the administration of antimonial wine. About an hour after the poison had been taken Dr. Beck saw the child, and found it in a state of stupor, from which it could not be roused by any ordinary means. Emetics were again resorted to, without effect. Cold affusions were then administered, and in a very short time the child seemed to feel the impression of the water, and exhibited symptoms of returning sensibility. On stopping the application of the cold affusions, it speedily relapsed into its former state of stupor. The water was again poured on the head, which soon roused it again, and during its use, it vomited very freely. The remedy was again suspended for ten or fifteen minutes. Finding the symptoms returning, recourse was had to the water, and with the same effect. It aroused the child, and again brought on vomiting. After this it gradually revived, and the next morning was as well as usual.

Case 10th. In the Western Medical and Physical Journal, we find the abstract of a case treated by Dr. P. B. Wilcox. The patient was an infant, seven weeks old. It had been in a deep sleep for eight hours; and was affected with violent convulsions, laborious respiration and suspended deglutition. After continuing the affusion of cold water for fifteen minutes, all the symptoms were greatly relieved, the convulsions ceased to recur, and the ability to swallow was restored. An emetic and cathartic completed the cure.

Drs. Jones and Copeland also, have treated poisoning by opium with cold water; but as the works in which their cases are recorded, cannot be consulted, I am unable to give the reader an abstract of them. They were, however, recoveries of the most

satisfactory kind, concurring in the clearest manner, to support the character of the remedy.

Case 11*th.* In the spring of 1826, I was called to Mrs. T. who laboured under colic. When I arrived, I found the pain so excruciating that I was under the necessity of neglecting the first indication to be fulfilled, and directed my attention exclusively to procuring her some respite from her exquisite sufferings. A drachm of laudanum was immediately exhibited, which procured her in the course of twenty minutes great relief. She was then bled; an ounce of oleum ricini was exhibited; and an enema ordered. I then left her. Three hours afterwards I was again summoned in consequence of alarm excited by a lethargic sleep into which she had fallen and from which she could not be roused. When I returned, I found her breathing oppressed and sonorous; the pupils were dilated and insensible; the pulse was scarcely perceptible, and the surface generally perspired freely. No preliminary step was taken; I had her immediately stripped to her chemise, and supported erect in a chair, while I poured cold water in great profusion upon her head. For fifteen minutes no effect was produced; there was no manifestation of sensibility. Now, however, her breathing became quicker and more spasmodic in its character. The remedy was continued; in ten minutes more she opened her eyes, and in about thirty-five or forty minutes from the commencement of the affusions she spoke. Whenever a disposition to sleep returned, recourse was had to the remedy, and by these occasional applications during a period of about three hours, she appeared to be nearly as well as ever. Castor oil was now administered and an enema ordered. Until twelve hours had elapsed she was not allowed to sleep more than ten minutes, and when there was any difficulty in awakening her, cold water was sprinkled in her face, which always had the desired effect. The next day she was entirely restored.

The system of this female, was peculiarly susceptible to the action of opium; for I have been invariably in the habit of using large doses of it in cases of colic, where the pain was great, but I never witnessed any unhappy effects from it before.

Case 12th. This is a continuation of the first case of puerperal convulsions recorded in the second number of this journal. This individual had taken, it will be recollected, one hundred and five grains of solid opium, and after the remedy had subdued the disease for which it had been prescribed, the deleterious character of the drug developed itself in the fullest manner. When the convulsions left her she was profusely perspiring; her pulse was rapid, but small, and after four or five strokes, there was an intermission during a period of time equal, perhaps, to three pulsations; she complained of great cerebral fulness and vertigo; her mind sometimes wandered. In the course of fifteen minutes her breathing became very much embarrassed; she fell into a state of stupor, which soon merged into deep sleep. Her body was now covered with excessive perspiration and every muscle in her body appeared to be in a state of perfect and permanent relaxation. Anxious to observe the influence of cold water taken internally, it was administered in large glysters, and poured into her mouth as long as she could swallow during the fifteen minutes just alluded to; but the symptoms developed during that period clearly evince that the remedy was not even sufficient to keep the drug at bay. Not thinking it prudent to rely upon the internal administration of cold water any longer, I commenced the application of it externally. The patient was supported in a chair and a stream of cold water was constantly pouring upon her head: during nearly half an hour the total helplessness of the system, I thought, if possible, was increasing; but then a shuddering respiratory effort was made. Indeed, I began to be disheartened, but this evidence of returning sensibility encouraged me, and I persevered, and at the expiration of an hour, she drew up her feet and opened her eyes. But a few minutes more elapsed when she spoke, and requested me not to interrupt her that she wanted to sleep. For the next half hour the remedy was diligently applied; during nearly the whole of which time she continued to expostulate with me about the impropriety of the practice in her situation. The vertigo, fulness of the head, and wandering of the mind had to all appearance subsided; her pulse was now more regular and

less frequent; there was moderate cutaneous warmth and the perspiration had ceased. She was now stripped to her skin, dry clothes put on, and she was put to bed. Considerable disposition to sleep occasionally came on, and when I retired, I left positive directions, that she should not be allowed to sleep more than fifteen or twenty minutes at a time. This was faithfully observed, and with the assistance of one or two unimportant auxiliaries, she was soon restored to entire health.

Case 13th. In 1827, I was called to a young woman, to whom her mother had given by mistake half an ounce of laudanum instead of the same quantity of tinct. cinchonæ comp. The articles were in vials and standing close together. She soon complained of the unusual taste but no notice was taken of it until three hours afterwards, when the period arrived for her to take another dose of the cinchona. To their great surprise however she could not be waked; the alarm was immediately given; the mother at once apprehended what had been done; the vessel out of which she had drank the laudanum was examined and gave out distinctly its characteristic odour. In an hour more I saw her, but in a situation so deplorable, that little could be hoped for from any remedy, however efficacious. She appeared to be dissolved in perspiration; she scarcely breathed; her pupils were dilated and totally insensible; her pulse could be felt, but that was all. The jaws were locked, she foamed at the mouth, had subsultus tendinum, and was in a state of profound coma from which she could not be roused by the most powerful stimuli. Cold water from a large bucket was constantly dashed with considerable force upon her head, shoulders and spine. Injections of the same were repeated every ten minutes; and a large male catheter being introduced into the stomach (for deglutition had ceased), a considerable quantity of the same fluid was injected through it into the stomach. With indefatigable diligence this remedy, in the various forms just alluded to, was continued for an hour and twenty minutes, before the slightest evidence of returning animation was developed. Then a general shuddering seized the respiratory muscles; and irregular and spasmodic efforts at breathing took place. For half

an hour longer there was no other manifestation of returning sensibility except an occasional deep sigh, and continual sobbing. Then the respiratory efforts became more regular and the inspirations fuller; she opened her eyes but closed them immediately. The use of the remedy forty minutes longer enabled her to speak, the muscles of the jaws having relaxed themselves; the subsultus ceased; the pupils contracted, and the symptoms generally, were subsiding with considerable rapidity. Fearing that the uninterrupted exhibition of the remedy for so long a time would make it lose its effect upon the system, I ordered its suspension. It was accordingly discontinued for twenty-five minutes, during which time, however, the poison evidently became again active; for instead of improving the patient retrograded. Of course, the remedy was again administered and with the same happy effect; the symptoms immediately moderated, and in the course of an hour and a half she could converse with a good deal of consistency and ease. There was still, however, a very great disposition to sleep when the remedy was suspended even for a few minutes. Its occasional application was continued for two hours longer, when I thought she was sufficiently out of danger to be allowed a little repose. This was indulged in about fifteen minutes at a time. In the morning she was nearly well; slight headach which she believed arose from constipation, harassed her. An active cathartic relaxed her bowels and restored her to health.

Perhaps, evidence more conclusive, derived from a multiplicity of sources, all tending directly to establish the same proposition, was never before adduced in favour of any therapeutic or toxicological agent. Employed in every stage of the disease, and always with the most uniform, satisfactory and flattering results, it cannot fail to command the confidence of the profession, and be elevated to a level with those remediate agents that possess a characteristic property and always produce a specific effect. Conclusive, however, as may appear the body of testimony brought forward in its behalf, I am unwilling to pause, when it is so completely in my power to lend great additional support to it, from a source different from that we have already

laid under severe contribution. This subject interesting in itself, becomes doubly so, when we reflect, that should cold water possess the virtue supposed to belong to it, it might be rendered eminently useful in the treatment of those diseases, soliciting the use of opium in such quantities as to endanger life. The treatment of such diseases, has been hitherto, rather unsettled and inefficient in its character, in consequence of the small doses in which the drug has been usually given. The want of an antidote, effectual in arresting with promptitude its deleterious influence, has led to this extremely limited and ineffectual manner of giving it. Indeed, a century ago the hand trembled when dropping from a vial the deadly poison, and the heart sunk within the patient who had to swallow it.

That my experience and knowledge of the efficacy of cold water, might be more correct, varied and extensive than could be derived from clinical practice, I instituted a series of interesting experiments. An abstract of these experiments cannot be viewed as unimportant, or foreign to the true character of this memoir: I shall, therefore, hasten to lay it before the reader.

Experiment 1*st.* To a large spaniel dog I gave two ounces and a half of liquid laudanum. His œsophagus was immediately secured by a ligature to prevent its rejection. This precaution I found necessary, as in several preceding experiments the animals had almost invariably thrown it up, and thus frustrated the experiment. In about five minutes he had a stool and urinated freely; his eyes became dull, languid and watery; his breathing oppressive and laborious; his tongue protruded from his mouth and he panted rapidly and loud. He foamed at the mouth; his pulse was feeble and slow; his posterior extremities became very feeble, which progressively augmented until an hour and a half had elapsed, when they were quite paralytic. In about two hours he was insensible. He was removed to a pump, and exposed during the space of an hour to a full stream of very cold water. In seven minutes he began to manifest sensibility; in ten he opened his eyes; in fifteen he staggered from the pump, but fell before he had gone ten steps. The water was continued occasionally, at intervals of from five to ten minutes.

for an hour longer, when he was entirely restored. The ligature remained on the œsophagus twelve hours after the completion of the experiment; consequently the poison was obliged to remain in his system. No remedies were used to avert any remote evil effects.

This experiment I repeated several times with unimportant modifications, but always, pretty uniformly with the same result.

Experiment 2d. Into the abdomen of a common cur, I injected six ounces of laudanum. The effects manifested were with little variation the same as those recorded in the first experiment; but the remedy was deferred at least two hours longer, insensibility not supervening until four hours after the introduction of the narcotic. It was fifteen minutes before cold affusions produced any impression, and two hours before he was considered out of danger.

This dog appeared in tolerable health till the fourth day after the experiment, when he expired. Upon dissection, extensive peritoneal inflammation was observed, which arose no doubt from the laudanum.

Experiment 3rd. Into the cellular tissue of the thigh of a bull bitch, I injected an ounce and a half of laudanum. The same effects with slight difference were developed in a few minutes, and with a violence that I had never before witnessed. She was insensible in fifteen minutes, and death I thought inevitable. Cold affusions from the spout of a pump were immediately commenced, and although they were continued with great diligence it was nearly an hour before she opened her eyes, and two before she could get out of the way of the water. With occasional affusions it was five hours before she was considered out of danger.

Experiment 4th. The crural nerve of a common cur dog was exposed, punctured and two drachms of laudanum introduced. The effects were violent and instantaneous; he was vehemently convulsed, and great apprehension was entertained that he would die before the remedy could be applied. He was placed under the spout of a pump, but no perceptible impression was made for two hours, and it was seven before danger appeared to

be removed. A servant, however, was left with him with directions not to suffer him to sleep, and if he should be inclined to do so, to resort to the cold water. During the space of two hours this application had to be made but once, after which he appeared to be so thoroughly recovered, that the boy ceased to watch him. About three hours after the servant left him, the dog dropped down and expired before any one could reach him. This animal owed his death to neglect, for in numerous experiments exactly of the same kind performed afterwards I never lost a single dog. It was however necessary to watch them from seven to twelve hours after they appeared to be out of danger.

To avoid tedious and comparatively unimportant details, I will just observe, that the above experiments were varied in every possible way, and generally with the same important practical result. The most essential modification consisted in administering by the mouth and anus large quantities of cold and frequently iced water, in conjunction with its external application; and I observed that sensibility was sooner restored, and that the system generally was sooner drawn from under the influence of the narcotic, than when this item in the treatment was neglected. When swallowed, the effect was not so prompt as when exhibited in the form of a glyster.

There is a peculiarity in some dogs which perhaps I should record. I have experimented upon animals of the canine species, that could not be injured in the least by quantities of opium or laudanum that would bring the lives of others into the greatest jeopardy immediately. I have given to the extent of an ounce of laudanum without producing any other effects than slight temporary hebetude, and a few hours of sound repose, from which they could be roused almost as easily as if they had not taken any thing. I have injected thirty, forty, sixty, eighty, and as much as one hundred drops of laudanum into the crural and external jugular veins, without impairing in any perceptible degree the sensibility; but I never injected laudanum into the cellular tissue without exciting the most alarming symptoms.

Enough I hope has been said to evince the decided superiority of cold water, in poisoning by opium, over every other known

antidote. It has been clearly demonstrated, that it has a peculiar and specific effect in withdrawing the system from under the influence of the drug, and that too with a promptitude and certainty truly astonishing. Its efficacy is only excelled by its simplicity and cheapness, and it is to be hoped, that its incontestable powers, will induce physicians to make a proper application of opium to those diseases of a spasmodic or convulsive character in which a sufficient dose is so much superior to any other remedy. In a great variety of other diseases my limited experience has convinced me, that large and what are now esteemed dangerous quantities are the only effectual means of arresting them; and this I would urge upon the physician, whenever it may appear necessary, with a boldness and a fearlessness of consequences, only commensurate with the unlimited and well grounded confidence I have in the powers of cold water. The Turk swallows opium with a hardy indifference, and the physician may now at pleasure disarm it of its terrors. The suicide must seek in something else, an asylum from his sorrows and his misfortunes; for certainly the physician will rouse him from his deep lethargic slumbers to a lively recollection of those harrowing thoughts, that made him court with maniacal violence the cold consolation of the grave.

Modus Operandi of Cold Water. The singularly efficacious character of this remediate agent, demands a further consideration before we close this essay. Its properties are strange and in some respects contradictory; and as much discrepancy of opinion still prevails with regard to its action on the system, though many ineffectual efforts have been made to settle the medical mind on this point, we cannot consider our memoir complete, till we have added another exertion to the trials that have been made, to roll the stone of Sisyphus to the top of the hill.

To every impartial and candid investigator it must appear very evident, that cold should not be viewed as an exclusively stimulant, nor sedative agent; but that under particular circumstances, it participates of an action directly stimulant, and of one as manifestly sedative. In the language of the Medico-Chirurgical Review, "it acts at first as a stimulant, in exciting sensa-

tion; then as a tonic, in condensing the living fibre; and lastly, paradoxical as it may seem, as a sedative, by preventing that distribution of blood into the minute and ultimate vessels, which is necessary for the existence of sensibility and irritability, and also by the abstraction of the stimulus of heat." The moderate action of heat and cold is alike conducive to the support of life; their immoderate effects alike injurious, since they annihilate moral and physical power. External heat causes apathy and languor, dissolution of the blood and other fluids, gangrene and death. Excessive cold chills, benumbs, debilitates, and produces even sphacelus and loss of life.

From what has been said of the manner in which opium produces death, it is very evident, if the views there entertained be true, that cold water in checking its deleterious effects, must arrest the alteration which is going on in the elective sensibility of the absorbents, and curtail, or entirely suspend the great and morbid expenditure of irritability of the same vessels. Any remedy capable of effecting these two objects, must according to the doctrine inculcated in this memoir, be admirably adapted to the removal of that state of the system, produced by a poisonous dose of opium. Thus, the phenomena developed, in the functions of those two fractions of the same system of vessels by cold, demonstrates that cold affusion is entirely adequate to the task. The first impression cold makes is upon the skin, and there it suspends cutaneous exhalation by imparting tone to the debilitated arterial and venous absorbo-exhalent vessels, which contracts their orifices and prevents their fluids from being distributed to the circumference. Notwithstanding all the comforts and delicacies of domestic life, the cutaneous excretions are less abundant in cold than in warm weather. People living in high northern latitudes perspire very little, while it is precisely the reverse with those in intra-tropical regions.

Cold also diminishes absorption quite as much as it does exhalation. Thus the poisonous agent promotes that function most injurious to the interests of the animal economy, while cold water has a directly opposite tendency. The effect of opium just suggested, is admitted by the whole corps of therapeutists,

and the following facts demonstrate that cold water has an effect exactly the reverse. Thus, the function of absorption is known to be more vigorous in the summer than in the winter; the density of the integuments, their dryness and the slowness of the external motions, prove this to be true. When the skin is pliant and supple, absorption is very active, and when an opposite state obtains, we endeavour to change it, by the warm bath, oily frictions, and such other means as may appear necessary. Moricheau-Beaufre is of opinion, that absorption does not go on in an intensely cold bath: the following experiment was performed to ascertain the fact. One of the most conclusive experiments in favour of cutaneous absorption, consists in suspending a new-born puppy during the space of fifteen minutes, in a bath of tepid ink; the urine afterward discharged will be coloured with it. Upon Beaufre's suggestion, I repeated this experiment with this modification; instead of tepid, I had very cold ink; but the urine was unchanged in character. This cannot be otherwise viewed, than as a striking proof, that cold does not favour absorption. In cold weather, we know it is difficult, if not impossible, to impregnate the system by the use of mercurial ointment; the patient is obliged to stand a considerable time before the fire to induce the dermoid absorbents to take it up. M. Beaufre informs us, that the body is less disposed in winter to absorb contagious miasma than in summer. He subjoins, "J'ai remarque qu' il se presentoit toujours, pendant l'hiver, moins de galeux a traiter dans les hopitaux et dans les regimens." The greater difficulty of curing dropsy and particularly the cellular variety in winter than in the more temperate months, is well known to every physician who has had any hydropic experience.

A knowledge of the influence which cold exercises over the functions of absorption, and of exhalation, but particularly of the former, would lead the reasoner to conclude a priori, that it must be admirably disposed to subserve the interests of the system, while labouring under the pernicious influence of an over dose of opium. Experience has verified the reasoning, by demonstrating that cold water is capable of supplanting its ac-

tion, of destroying its impression, and of instituting in its place, one more conducive to the welfare of the animal economy. The function of absorption ceasing, and the deleterious impression which the venous absorbo-exhalents have already received being removed, they have a fair opportunity to recover the normal elective sensibility which has been so materially blunted, and perhaps nearly extinguished. Peripheric exhalation is checked by the tone imparted to the arterial absorbo-exhalents; in consequence of which, the fluids are unable to reach the surface in such abundance as before. Thus, by the suspension of absorption, opium is precluded from making any further deleterious impression, and by the suspension of exhalation, the system at large is shielded from additional exhaustion. These are the two functions primarily deranged by opium; they are likewise those upon which cold water most powerfully exercises its energy. By the former their functions are morbidly increased—by the latter they are decreased. We, therefore, confidently believe that if the physician reaches his patient before the elective sensibility and irritability of the arterial and venous absorbo-exhalents are entirely exhausted, the prompt and vigorous application of cold water, without the assistance of any auxiliary remedy, will be quite sufficient to suspend those functions upon which danger depends, to destroy the impression the narcotic has made upon the vessels performing them, and thus give them time to regain their altered elective sensibility and expended irritability.

An abstract of my views is here presented, but the length of this essay being already greater than was originally contemplated, absolutely prevents my entering at this time into detail, which would enable me to be better understood and I humbly hope more readily and generally believed.

JULY 14TH, 1828.

Art. II.—*A Dissertation on the Remote Causes of Fever.* By Ranson Malone Collins, M. D. of Feliciana, Louisiana.

The primary, indeed the sole object of every individual who presumes to offer his thoughts and opinions on subjects of interest to the human family, and more especially those which have reference to the health, or the causes operative in producing disease and consequently involving the happiness and enjoyment of man while sojourning here, should be truth and such a developement of facts as shall aid us in establishing just and correct principles, not only in therapeutics, but in etiology. For without a correct knowledge of the causes operating to produce disease, our system of hygieine must be imperfect; and without a knowledge of the seat of disease, and its character, our practice must be a blind and hap-hazard course of empiricism. And he who proceeds to administer his remedies without knowing why, is, to say the least, no better than one who in a dark night fires his musket in the direction of a company of persons, not knowing whether he may kill or not. And he, if he chance to strike an individual, will be no less a murderer, than he who marches up in open day and shoots down his antagonist.

Impressed with these ideas, I have been induced to offer some remarks, which have long urged themselves on my attention, in relation to the causes productive of our autumnal fevers. Not that there is any scarcity of theory on this subject, but that however copious the writings and opinions may be, there is still no evidence incontestable of the facts which they seem to set forth. Since the promulgation by Lancisi (a celebrated physician of Italy,) of the miasmatic origin of fevers, so far as I know, few if any attempts have been made to account for them on any other principle: and at this time it would seem that inquiry is paralyzed, and physicians have contented themselves by always referring the origin of the cause of fever, to some stagnant pool, duck pond or heap of decomposing vegetable, or animal matter.

The theory of Lancisci, I say, seems to have been universally adopted; but I am totally at a loss to know what, save mystery, constitutes its recommendation. There would appear to be something interwoven with our very nature, which had a kind of predilection for that which is mysterious, and makes us ready to assent rather than be at the trouble of patiently enquiring into the reality of assumptions. That this is purely an assumption is evident from the fact, that there is not a solitary scintilla of evidence going to prove its existence in the manner and form assumed, notwithstanding many experiments have been instituted with a view to detect it. Am I told that *in philosophising*, we are in the habit, when we observe certain phenomena, of referring them to some cause capable of *producing* them; and when we can discover no sensible, we infer an insensible, and that it is highly unphilosophical to withhold our belief? Granted; for except by the effects we see produced, we should know nothing of gravitation, attraction, repulsion, &c.; yet the existence of these principles is rendered as certain as any law of nature; and of all first principles, our knowledge must be derived from effects. Not so of substances which are only the result of chance, and may affect us to day, and never again: if we predicate any thing of these, it behooves us to show not only that they exist, but that they are capable of producing the effects attributed to them. I therefore, ask those who maintain that there is a fever-generating miasm, the product of decomposing vegetable and animal substances, to exhibit it in a sensible form, and let it manifest its deleterious effects. That we are subject to febrile attacks, and that fever constitutes at once the great scourge and terror of our country, we have abundant reason to admit; and any information of the causes, which might enable us the more effectually to guard against them, would be hailed with universal joy.

As a preliminary step, I will give a brief outline of the face of the country in that part of Louisiana, in which I have lived for several years. Many persons consider this to be a very low, flat country, every where abounding with pools of stagnant water. The very reverse however is true, as regards the

country remote from the large water courses. This portion of it is considerably rolling, and in many places very much so; the soil is fertile and the growth luxuriant; the crops consist of corn and cotton, the latter of which is largely cultivated, and as you approach the coast sugar-cane is extensively cultivated. The common growth of the forest is oak, hickory, beech, ash, poplar and gum, with some pine. The waters of the creeks and bayous is somewhat turbid, but pleasant to the taste. In sinking wells, which are common, you will find water at the depth of from 30 to 60 feet, passing through alternate strata of clay and sand until you arrive within a few feet of the water, when you come to extremely fine sand, which they call quick-sand. In the summer, our rains and winds come generally from the south and south-west. Our nights are remarkably cool, when compared with the heat of day; the thermometer ranging from 85° to 97° of Fahrenheit. Our fall and winter climate is exceedingly variable, ranging from 30° to 75°, and this frequently in a few hours. This is as fair an outline of the district of Louisiana in which I reside, as I am capable of giving; and may be applied to all that portion of the state north and north-east of the city of New-Orleans. Stagnant water is exceedingly rare even on our considerable creeks; but is found more or less considerably on the larger water courses. I have been particular in mentioning this fact, knowing that these have been pointed to as the laboratories, whence this febrific poison is abundantly manufactured. But remote from any water course, on the summit of the highest hills, as well as in our valleys, we not unfrequently meet with cases of remittent fever of the most obstinate kind. Nor does my experience go to the support of the opinion generally held, that on water courses fever prevails most, with the exception of the intermittent which readily yields to the appropriate remedies.

To account for this in accordance with the generally received doctrine of the miasmatic origin of fevers, I must acknowledge I am unable. Why should intermittent fevers be more prevalent in marshy districts than remittent? We are told that marshes produce the remote cause of fever: and why should

they be more prevalent in new settled countries than remittents? I have conversed with many of the first settlers of this country, who told me that there was scarcely a disease known, save ague and fever, before the country was improved. The same sun that warmed it then, warms it now. But will it be contended that there was not then a sufficient amount of heat, moisture and vegetable matter, to produce miasms? I presume not.

I would not be understood to say that in marshy districts there are no cases of remittent fever; but that their frequency in proportion to the cases of intermittent, is greatly reduced when compared with the country remote from these districts: at least such has been my experience on the subject, and I ask if such is not the experience of the physicians generally, practising in the Mississippi valley?

Another observation which I have made in relation to fever, is that in our dryest and least fruitful seasons, fevers are always marked with a greater degree of malignancy than wet seasons; not unfrequently terminating with black vomit and other symptoms of yellow fever. During the last summer, which was unprecedentedly dry and hot, this fact was abundantly exemplified, our bills of mortality having never been greater when compared with the number who were attacked.

From these facts it would follow as a necessary consequence, according to the received opinions relative to the remote cause of fever, that in proportion to the heat and aridity of our summers, would be the amount of decompesition and the virulence of the cause proceeding from it. I mean to say, that decomposition would go on more rapidly, forming a greater amount of "fever generating miasm," and this amount would possess more deleterious influence on our systems in dry and hot summers, than when the seasons are regular. Otherwise, there must be a greater predisposition produced in our systems for disease. One of these two circumstances follows as a legitimate deduction from the premises laid down. But that either of these happen is not altogether certain, nor indeed probable. That decomposition goes on more rapidly when there is a plentiful moisture associated with a due degree of heat, the expe-

science of every man must long since have taught him. And this amount of moisture must not be such as one could imagine to arise from a parched and thirsty land—but such as would arise from frequent and plentiful showers. That there is produced in the system a greater predisposition to disease, does not accord with experience; for in fact there is, so far as I know, always a greater amount of fever, in wet summers than in dry; the former being much more productive of intermittents, the latter of remittents. Hence it would not seem to depend so much upon a want of predisposition to disease, as upon a want of proper character in the impressive agent.

Here I am aware that the doctrine of dilution may be wielded against me with seeming advantage; but I humbly conceive that before we proceed to dilute a substance we should be able to exhibit it in some sensible form; unless indeed a substance can exist without a form. Nor does it rest with me to prove that it cannot be diluted; but reasoning analogically in relation to it, I should say, that the evidence was against this supposed dilution, by moisture, or any other media. If there exist a poison capable of producing fever, it is a specific poison producing a specific disease; in like manner that a certain virus produces small pox, another measles &c. But so far as I know, none have ever contended that any atmospheric state was capable of diluting these agents of disease, so as to exclude him who comes within the pale of their influence, from an attack. Nor do I conceive we would have much to dread from its effects, were the doctrines of dilution, gravity, and distance at which it seems to be efficient, as advanced by one of its able advocates, established: namely, 1st. That its "specific gravity is equal to that of the atmospheric stratum thirty feet from the surface of the earth; 2d. "That its efficiency is limited to a circumference of one mile; 3d. "And that there is between it and water, a very strong affinity existing."*

I say if these be facts, we should expect that in the first case, none would be affected except those who might be in its ascend-

* These doctrines were advanced by Professor Caldwell in his Lectures, in 1826–7.

ing range. For so soon as liberated, it would seek that stratum of atmosphere of its own specific gravity.

In the second, I would enquire where we are to look for that miasm, which inundates the sand hills of Mississippi, Georgia, and Carolina, with fever? There are no marshes, rivers, or stagnant pools which can be pointed to, as giving it origin.

In the third, we should always expect our febrile epidemics to be arrested on the occurrence of a plentiful fall of rain. It is scarcely necessary to say that such is not the fact, as a general rule. And again, why should there be any fever in wet seasons? Yet these are as a general rule more sickly than *dry*.

It is evident that those who contend for the miasmatic origin of fevers, have endeavoured to accomodate it to every *possible* circumstance; and have assumed a thousand things of it which are insusceptible of the least proof. For instance, when they have seen those inhabiting the third stories of their houses, partially exempt from the effects of an epidemic fever, they have discovered an important fact; namely, that miasm never ascends so high: and when they see those immediately situated on a mill-pond, labouring under intermittent, while those at a distance are partially exempted, they seem to discover, that miasm is not effective at a greater distance than one mile. And when after a copious shower an epidemic seems to abate, they assert that water has an affinity for miasms and that a chemical union has taken place which has brought about this effect. But it seems to me that a much more satisfactory solution of these phenomena might be found in the less stagnant condition of the atmosphere at the distance of thirty feet from the streets in a city, and its exemption from a great many of the grosser impurities, which it must necessarily suspend amid the stir and bustle of a *commercial* town. But still more important is the circumstance of their being removed above that stratum of atmosphere, which is rendered exceedingly impure by the effects of respiration. As regards the second case, I would remark that those situated on the margin or in the immediate neighbourhood of large water courses, are always subjected to an atmosphere surcharged with moisture, which, under certain conditions, is showered down

on them in the form of a copious dew. That this must be productive of diseases is evident. And here I would beg leave to mention, the wonderful coincidence of effect observable in the present situations; and in new settled countries of the south, a superabundance of moisture in both cases, giving rise to intermittent fevers. And as to the third case, it does not appear to me at all necessary to account for the abatement of an epidemic, when such is the fact, by supposing that the cause productive of that epidemic, is removed by its affinity for water. It appears to me to be simply in consequence of a change of impressive agent; viz. there is always accompanying a fall of rain, an atmospheric change which would seem to act on all in whom there is a sufficient degree of vital energy remaining, on the great principle of counter-impression—that principle by which all diseases are, and ever must be cured. Every physician is prepared to expect a change in the condition of his patients, when there is a considerable change in the atmosphere: to some it proves salutary, while others grow worse in exact proportion, as before said, to the capability of the system to accommodate itself to it.

I have now come to that part of this paper, in which I contemplate giving my views on the causes of fever, as they have been urged on my attention during my residence in the south. Admitting, that were the causes known they still might be beyond the controul of man, yet this knowledge might lead to the adoption of some course calculated to modify their influence; thus vastly lessening the amount of disease and human calamity. That this is a subject claiming the particular attention of every enlightened physician and philosopher, need not be suggested anew. For it may be truly said, that he who can divine the causes of disease, and suit his remedies to their removal, deserves more lasting and universal fame than a thousand who devote their time and talents to the invention of missiles, which like Perkin's steam cannon, are capable of destroying sixty human beings in a minute.

I would not by any means, be thought to use this language as self complimentary; for I must acknowledge that all I have

done in this way amounts to little, and I have no other object in view at this time than an endeavour to awaken inquiry into the subject of fevers, not being content with the present theory.

Climate may be defined to be that peculiar constitution of the atmospheric fluid, modified as it is by the amount of heat, humidity, aridity, electricity and quality of soil, which immediately invests the earth, and in which all animals move and breathe. Philosophers have imagined, and justly, a certain change in these peculiarities of the atmosphere as we recede from or approach the equator, and have consequently drawn imaginary lines, which we designate by the name of equatorial lines or degrees. The only sensible difference in these different climates, results more especially from the presence or absence of caloric, or of humidity, the chemical constitution of the atmosphere being the same in all places and under all conditions; for whatever impurity there may be in the air, it is only suspended and makes no change in the chemical character of that fluid, otherwise, it would lose its identity as air, and would no longer subserve the purposes of respiration. That this fluid by which man is surrounded, should, constituted as he is, exert a powerful influence on him is not at all extraordinary, inasmuch as it is constantly undergoing changes in relation to the amount of agents capable of powerfully impressing the system, which it suspends. I would here remark that I speak only of those agents which are cognizable by our senses or chemical tests. But there is one general characteristic of every climate, in every equatorial degree, which stamps its influence on its inhabitants, constituting what may be called a *local temperament*. This peculiarity would seem to consist almost entirely, if not altogether, in the amount of caloric and the length of time during which we are exposed to it. Thus we find that exactly in proportion to the length and heat of our summers is the predisposition to abdominal diseases, and in proportion to its shortness and coolness is the predisposition to thoracic diseases. To be convinced that this is the case as a general rule, we need only take a survey of the diseases commencing near the equator and travel north. In doing so, we shall find (as we

we recede from the equator) the diseases either specifically different, or more or less aggravated in their character. This is the case, whether we have reference to marshy districts or to arid plains; and this climatorial tendency is alone modified, in its production of disease, by our peculiar constitutional predispositions. For, were these the same, all disease would be the same, as respects its character; and in the same neighbourhood we should find every individual labouring under remittent or intermittent fevers, or pneumonia, &c. But our congenital predispositions or temperaments being different, the climatorial or local can never produce an entire change, so as to render the diseases identical, or their curative indications, the same. This constitutional predisposition, directed and influenced by climatorial, is not only observed in the diseases, classed as non-contagious, but the same seems to obtain in those which are contagious, so far as I am allowed to judge; thus small pox, measles, chincough, &c. all appear to be influenced by the same causes.

To be more explicit, I will say that our congenital predispositions are the result of physical structure; and these acted on by the influence of climate, produce in each a predisposition to a certain class of diseases which need but an exciting cause to develope them. In no other way do I think that a phenomenon, which frequently occurs, can be accounted for, viz. the prevalence of measles, pleurisy, intermittent and remittent fevers at the same time, and in the same neighbourhood,—a phenomenon familiar to every practitioner of a few years standing, and which was more especially the case in the year 1824. Now shall we presume that there were different extraneous matters producing these diseases, all in the same vicinity? Or is it not more rational to suppose that the same cause, acting on a diversity of congenital predisposition or susceptibility, gave rise to this diversity of diseased action. The latter seems to me much the more probable of the two, unless indeed those who contend for the miasmatic origin of fevers should contend that this same substance is the remote cause of all diseases. But I am not aware that it has ever been suggested as even probable, that marsh effluvia are instrumental in the production of measles;

pneumonia, or pleurisy; yet these all prevail together with fever. If then the same cause, acting on a diverse susceptibility were productive of this variety of disease, I see no impropriety in ascribing all the diseases of the climate, nor indeed of the world, (save contagious diseases) to the same remote cause.

But I would here remark, that in using the term *remote cause*, I have an entirely different allusion from what is commonly understood by the writers and physicians of the present day. They have allusion to some insensible poisonous agent afloat in the air, the result of decomposition, or recomposition. I mean simply climate, or that peculiar constitution of the atmosphere which exists in different latitudes. The operation of this on our particular congenital predispositions to disease, together with every external cause, such as *situation*, *occupation* and *mode of living*, I consider to be the only remote causes of disease; that these are under all circumstances, operative, and need nothing but an exciting cause to develope disease at any period of our existence; that we are born with a predisposition to disease, and that this predisposition remains (only subjected to various modifications by the foregoing causes) during life. I am at a loss to know, why we should need any other remote cause than that which we abundantly find in our constitution and the character of our climate; and if we can account for the production of fever from the operation of these causes, I know no reason why we should lay aside our senses, and wander into the field of conjecture.

We have volumes written on the effects of climate, and the consequences to be expected from a sudden change from one to another, whether this be a removal from north to south, or vice versa: it is immaterial in what direction we travel, provided we pass beyond the limits of that particular atmosphere with which we have for a length of time held intercourse, disease, as a general rule, will result as the consequence. Nor does it matter whether we move from a healthy to a sickly situation, in common phrase, or the reverse. Viewing man constituted as he is, endowed with a very extensive and highly sensitive surface, (including the alimentary canal and lungs), and

constantly subjected to the vicissitudes of climate, we should, a priori, be led to wonder, not that he is the subject of disease, but rather that his whole life is not one scene of affliction. But we shall cease to wonder when we recollect, that the Great Author of our being has endowed this living machine with a capacity to accommodate itself in a very eminent degree, to the circumstances which surround it; and that impressions which have not the power to destroy life, by continued application partially lose their effects: or in other words, a kind of relationship is established betwen them. And when once this relationship is set up, it becomes absolutely necessary, under existing circumstances, that this impression should be continued for the well-being of the individual; for any change of the impressive agent must and will be followed by disease, which will be more or less compatible with healthy action. As an evidence of this fact, let an individual who has been in the habit of stimulating his stomach by the use of ardent spirits or mustard, before and during his meals, change these for cold water and claret, and the consequence will be a fit of indigestion. But if he continues this practice of using claret and water, very soon the stomach accommodates itself to this new impression and proceeds in the healthy discharge of its functions. And thus I think that all diseases which are not contagious, may be rationally accounted for; taking into account our peculiar hereditary and climatorial predispositions, together with the amount of vital energy in the system; for these are they which give character to disease, and a sudden breaking up of established relationships, proves a powerful and an entirely efficient exciting cause. For example, let us suppose an individual to be exposed for a length of time to the scorching rays of a tropical sun; what shall we be prepared to expect as a necessary consequence? A powerfully debilitated condition of two, if no more, of the organs, than which none are of more importance in the economy of health, viz. the skin and liver; these are stimulated into a powerful and preternatural secretory action, which exhausts their excitability and leaves them in a corresponding state of torpor and inactivity. Let us now suppose the sudden fall of a shower

with a change in the state of the atmosphere; we shall find as the consequence of this new impression on the skin, a sudden recession of the blood from the circumference to the centre, producing a congested condition of the abdominal viscera, which will be permanent or otherwise, in exact ratio with the previous expenditure of vital energy. The liver, as before said, in consequence of that consentaneous action with the skin, which appears to be generally admitted to be fact, is found in a condition which invites congestion: this takes place, and fever is found to be the consequence. And it matters not what other organs become diseased as the consequence of this; observation abundantly proves that here lies the "onus morbi," viz. in the hepatic system; for, restore the healthy functions of the liver, and you cure the disease.

This appears to me to be a case fairly made out, and in the whole process there is not wanted other aid to produce disease than what is found in the variability of our climate. And if we are able to arrive at a thorough conviction of the fact, that one case of remittent bilious fever is capable of being produced by changes of atmospheric impress, why should we call in the aid of an insensible, ideal agent for the purpose? I humbly conceive that it is time to lay aside this method of causation, which seems to me only calculated to present a barrier to, and damp the ardor of inquiry. But I must acknowledge that it is at times vastly convenient to call in those aids, which seem to be very like sympathy, the conservatrix et medicatrix naturæ, &c. These phrases, explain entirely too much, therefore they explain nothing. But to proceed. Let us again suppose an individual walks several miles in the heat of the day, and immediately plunges while reeking with sweat, into a river; shall we not expect a case of fever to be ushered in immediately? Most certainly, and we shall not be disappointed in our expectations; as I have several times experienced "in propia persona." Is it presumable that the most violent of the miasmatists would think it necessary in this case to call in the aid of their destroying angel. And if not in this case, why should it be thought necessary under ordinary circumstances? For although there may not at any time be so-

great a transition from heat to cold as in the latter case; still the same cause is operative, more or less every twenty-four hours. But I would not be understood to confine all my remote causes of diseases, to a preternatural amount of caloric, or its absence; although this I believe to be the sole cause in the cases supposed above. But whatever is capable of producing a state of preternatural debility in the secernent system taken in the aggregate, or in any one individual organ of that system, is the means of congestion being invited, and a suspension of the secretory function follows as a necessary course. That there is some climatorial attribute, which produces a predisposition to disease, and that a change of accustomed impression, by breaking up established relationships, developes this disease, to me seems to be incontrovertible, and is abundantly proven from the fact, that those inhabiting different districts, or living in different latitudes, are subjected to different diseases, if not totally different in character, at least very different in degree. Thus we find those living in a northern latitude subject to thoracic diseases, while those of a southern, labor under abdominal, and those intermediate are affected with a combination of both, or thoracico-abdominal. In one district we find an endemic affection of the thyroid gland; in another, a disgusting affection of the scalp; while tetanus prevails epidemically among the children of another. This at once shows the influence of climate in producing a predisposition to diseases, in accordance with its peculiar constitution; and when once the predisposition is created, an exciting cause is only wanted to awaken it into actual disease. Where shall we look for this? I answer in the variability of atmosphere, on our *sideboards*, on our *tables*, in our nocturnal *vigils* and mid-day *exposures*. Here are sufficient exciting causes which none will deny.

But should doubts arise as to the propriety of ascribing the remote cause of fever, to the influence of climate on our congenital predispositions, I answer the same doubts and objections would arise in reference to the production of every disease to which man is subject. And we should have a right to ask, what are the *remote predisposing* causes of *pleurisy*, *pneumonia*, *rheumatism*, *hydrocephalus*, *tetanus*, and a thousand others? If we must

lay aside our senses, and ascribe certain phenomena which take place, known by the name of disease, to some insensible agent in one case, I see no reason why we should not be compelled to do so in every case. But when an influenza rages in a district of country, we are gravely told that there is an epidemic constitution of the atmosphere—language truly explanatory. The fact appears to me to be simply this: that these occur at a season, when we are strongly predisposed to thoracic diseases, from the operation of the cold weather of the preceding winter, they most commonly appearing in the spring season, when our climate is exceedingly variable, and when a sudden change from warm to cold, produces the disease in all, when there is not sufficient energy in the system to resist, or in other words, to accommodate itself to these changes without manifest injury. True, these may occur to a small extent, on the coming of cold weather, or during winter; but appear to be confined to those who labour under a strong hereditary predisposition to thoracic diseases. If a miasm is necessary in one case, it is equally so in another, but I do not recollect to have seen any attempt to prove the existence of a pleurisy-generating miasm. Nor indeed would it seem to me at all necessary, provided the existence of one capable of producing bilious fever be universally acknowledged. For should this be considered capable of producing in him who is predisposed to hepatic disease, a congested condition of the liver, why not produce the same effect on the pleura of him who is predisposed to pleuritic affections? If it can produce bilious fever, it can produce lung fever; for between fevers I know of no difference, except what results from their locality; or the importance of the organ or organs labouring more especially under the burthen of disease. Nor indeed do I perceive any difference between inflammation and fever; other than that the one is a grade of the same action more exalted than the other; the primary link in the diseased chain being the same (so far as I can discover) in all inflammations, and in all fevers, and depends on a state of debility in the affected organ, produced by any cause.

It would consequently seem only necessary that the remote predisposing cause be one capable of producing debility in some

one particular organ, (say the liver,) in order that an individual by the application of an exciting cause, should have an attack of fever. That the cutaneo-hepatic sympathy of Johnson has been called in question I am aware, but observation must teach every medical man that in proportion to the excitement produced by heat on the skin, so will be the predisposition to hepatic disorders. This is a strong argument in favor of a consentaneous action, (call it sympathy or what you please) and when we find the skin in a scarcely excitable condition, we shall always find a corresponding degree of torpor in the liver; and I will venture to say that in proportion as the heat augments, in our approach to the south, so will we find increased the various affections of the liver, both organic, and functional. Can this be accounted for satisfactorily, by supposing or assuming that there is in proportion to the amount of heat, a greater evolution of miasmata? I presume not; for there must be some degree of temperature at which this substance (if it exist at all) is disengaged with most facility. And if, as Cleghorn remarks, diseases are less frequent in dry and warm summers, we should expect as we approach the equator, to find the country more healthy, but it is scarcely necessary to remark that such is not the fact. Nor does it appear more satisfactory to resort to the supposition, or assumption, that hepatic diseases are the result of a weakened action of the heart, occasioned by the action of miasmata on the blood whereby it is rendered less stimulating. And I must beg leave to dissent from every theory, which locates fever elsewhere than in the abdominal system of organs. That miasmata, or any foreign substance acts on the blood, except through the medium of the solids, is what remains to be proven. Nor is at all probable, if inhaled, that any effect could or would be produced on the blood, but at the expense of the integrity of the lungs; for so long as these maintained their healthy condition, they would perform their function perfectly on the blood, whether it be to secrete from or transmit to it, certain matters injurious, or salutary.

Now observation abundantly shows that the first indication

of an approaching paroxysm of fever is not to be found in the pulmonary system. But we shall find for several days previous to an attack, a certain sallowness of the skin, and disinclination to active exertions, such as we always discover in the incipient stage of jaundice, and the same by which the physician is led to pronounce without hesitation, that the *liver* is deranged in its function. That there is a feebleness in the force of the heart's action previously to the full developement of *fever* is not denied. But that this is the organ bearing the "onus morbi," and this in consequence of a want of exciting capacity in the blood, occasioned by the action of miasmata upon it, does not appear quite so clear. But should I be mistaken on this subject, I would ask, by way of obtaining more light, how (supposing the heart to be the organ first affected, and this in consequence of the action of miasm on the blood) should we ever expect to cure a case of fever while the patient lies constantly exposed to this same miasm, which if once capable, is always capable of producing this effect on the heart, and a consequent engorgement of the vena cava and its branches? Are we told to remove the cause, then must we remove that which is entirely beyond our control, miasmata being the cause, a debilitated condition of the heart the effect.

But admitting that previously to and during the continuance of fever the blood is darker, and that black blood does not stimulate the left side of the heart, this does not go to prove the existence of miasm, nor are we authorized to predicate such effect from it; so long as this phenomenon could be accounted for by reference to causes which are appreciable to our senses.

If it be admitted that continued and excessive heat has the indirect effect of debilitating the hepatic system, then we could, I think, account for this effect on the blood on perhaps as rational principles, if not more so, than the supposition of a miasm. If we resort to chemistry, whose aid I would never wish to ask in accounting for any vital phenomenon, we shall be told that the dark colour of the blood depends on the presence of a certain substance called carbon; that this substance is secreted from the blood, not only by the lungs, in the form of carbonic acid gas,

more especially by the liver, constituting a very considerable ingredient in the bile. Now if the *liver* be deranged in its secretory function, what will be the consequence? The retention of a super-abundance of this substance, together with others whose presence is incompatible with the economy of the system. These would reach the right side of the heart, thence sent to the lungs, where a portion of this carbon would go to combine with the oxygen inhaled; the balance would pass into the left side of the heart, producing all the effects predicated of dark blood.

That such is the fact appears to me very probable, from the sallowness of the skin several days previous to an attack of fever, and before any change can be perceived in the force of the pulse, evincing that the liver is diseased prior to any effect being produced on the heart. And I can readily conceive that the hepatic derangement must be greatly augmented by the effect which it produces on the heart.

I am fully aware that I have ventured on a subject, where there is a vast and overwhelming weight of authority against me. And on that account, I shall perhaps be unable to excite much interest or inquiry. But I ask physicians to think for themselves; it is time to shake off the shackles of mystic theories, and seek for the causes of disease among appreciable agents.

ART. III.—*On the use of the Bandage in Gun-shot Wounds, Fractures, &c.* By BENJAMIN WINSLOW DUDLEY, M. D. Professor of Anatomy and Surgery in Transylvania University.

Notwithstanding the bandage has been spoken of by writers in every period of the history of medicine, the views of practitioners are extremely limited in regard to the extent of its application in the daily exercise of the profession. All those authors who have expressed confidence in its efficacy, and have ventu-

red to recommend it to the public, have confined their remarks on its utility to a few insulated cases of disease. No one has published any thing on the general principles of its action; nor is there any work with which I am acquainted, setting forth its advantage in the various diseases to which it is the design of this paper to show its application.

It is not known to what circumstance this extraordinary want of knowledge of the efficacy of the most important of all the agents in the hands of the surgeon, can be attributed. The principle which governs the action of the bandage on each of the sub-systems is so plain, while the effects of it upon the whole are so manifest, and at the same time so controlling, that it is difficult to understand how the medical world has laboured so ingeniously, and so long, in the perpetuation of error, to the exclusion of plain, practical, and most extensively applicable truths. Morbid Physiology, or that science which makes us acquainted with the relationships instituted between the different organs of the system by disease, is a branch of our profession hitherto but little cultivated. It offers an extensive and beautiful field for observation; and to its devoted cultivators, the richest rewards in professional distinction.

The bandage is a remedy so accessible to all, so simple and plain in its mode of action, so extensive in its application, so satisfactory and controlling in its influence, that the strange manner in which it has been overlooked by those who have been most reputably engaged in extending the usefulness of the profession, is calculated to excite astonishment. The catalogue of means by which the benefits of the science of surgery are secured to society, can furnish no parallel to it.

When properly understood the bandage is calculated to supercede in a very great measure the use of the knife and the saw on the field of battle; nor will it be found less valuable in naval, hospital and private practice.

A very large proportion of those cases which, in the exercise of the surgery of the day, are condemned to amputation, are susceptible of preservation by the judicious use of the bandage; while the life of the patient is in much less jeopardy than either

after amputation, or under the influence of common remedies directed with a view to the preservation of the limb. The confinement and sufferings of the patients, as well as the attention necessarily given by the surgeon, are all much curtailed when fractures are put under the skilful application of the bandage.

The objections which have been urged by writers of standard authority against its use, have grown out of a misconception of its mode of action, together with a misapplication of the remedy. Like all other powerful agents, it is capable of doing much mischief when resorted to under improper circumstances, or applied by those who have neither principle nor experience as their guide in practice. The difficulty attending the correct application of the bandage to a limb, has been urged as an objection to the remedy. Any one of the more valuable articles of the materia medica would require more time and a higher intellectual effort to become thoroughly acquainted with their medical history, than would be necessary to become familiar with the action and the mechanical application of the bandage.

In calling the attention of professional men to this subject, and in appearing as the warm advocate for the efficacy of mechanical pressure in a great variety of accidents and diseases wherein authors of distinguished standing have condemned its use, I am aware of the ground I occupy. Some from pure and elevated considerations, and others from low and ignoble feelings, will denounce the temerity of the undertaking. Among professional men there is generally but little fondness for innovations. The educated are generally wedded to principles and speculations embraced in early life. The ignorant and presumptuous denounce all efforts at improvement and discovery as professional heresy. Empiricism is alarmed at every rational effort made with a view to the development of sound principles. During the last fourteen years I have been constantly engaged in observing the effects of the bandage on gun-shot wounds and fractures, on fistulous, indolent, indurated, irritable, fungous, varicose, inflammatory, and sloughing ulcers; on contusions, sprains, and effusions; on inflammations of the cutis, capillaries, veins, arteries, nerves, ligaments and capsules; on arterial and venous hæmor-

rhage, on aneurisms, on the secretions, on ulceration, phlegmasia dolens, paraphymosis and chordee; on lacerated and clean cut wounds, on the stump after amputation, on periostosis, fungus cerebri, and fungus testis; on the muscular, absorbent, sanguiferous, and nervous systems, and have had daily and increasing evidence of its superiority over any other local application in the practice of the profession.

It is probable that correct opinions on the influence of mechanical pressure may be acquired with more facility by looking to its effects upon the various tissues of the body in health as well as in disease.

The effects of pressure upon a tumid skin, upon erysipelatous and other inflammatory affections, and upon suppurations of the cutis, are superior to those of any other application which has yet been suggested.

The influence of the bandage on the arterial system is not less decisive than upon the skin. The public is fully apprized that Sir Astley Cooper forbids the use of means calculated to approximate the fragments of a broken bone, until by the application of local, and the administration of general remedies, all irritation, inflammation and swelling in the parts adjoining have subsided; and then we are cautioned against the mischievous effects of too early an application of the bandage, which he has frequently found productive of a recurrence of these symptoms. Probably but few individuals of this or any other age have higher claims of gratitude on society than Sir Astley Cooper; but notwithstanding his great attainments, and distinguished usefulness, like all other men he is liable to err. The unvarying effects of pressure are a contraction of the circulating vessels of the part, and a diminution of magnitude by absorption. Ulceration, and in some instances sloughing may arise from its improper application; but this constitutes no valid objection to the proper application. The abuse of the greatest good becomes an evil. In some particular cases of hæmorrhage inefficient pressure becomes a cause productive of continued bleeding; and yet who can doubt for an instant the propriety of resorting to pressure with a view to control hæmorrhage in those cases when

pressure can be thoroughly made. It becomes then a matter of some interest to enquire into the causes which have encouraged that error relating to the influence of the bandage, which ascribes to it the quality of exciting and promoting inflammation; since by exposing a false position in practice, one material step is made towards the propagation of truth, and the diffusion of useful knowledge. In the treatment of fracture of the patella Sir Astley Cooper enjoins it upon the surgeon to rely on the influence of repose, position, and of those washes and poultices commonly recommended in similar cases, until through their agency, aided by constitutional remedies, pain, swelling and inflammation of the part have subsided. Then the bandage is directed to be applied, one above the superior, the other below the inferior fragment of bone, for the double purpose of overcoming muscular contraction, and of retaining the bones somewhat approximated, if not in direct apposition; while the surgeon is particularly guarded against the morbid influence of these ligatures, since they are calculated to produce and do very often re-excite inflammation and swelling in the limb, thereby occasioning a necessity for their removal. The imposing influence of popular names and high authority is but too well calculated to perpetuate error, and check rational improvement. To me it is rather a subject of astonishment, that the two bands directed to be applied, do not in every instance re-excite swelling and inflammation in and about the knee; since the same circumstances might be anticipated were ligatures passed around a healthy limb. Were the bleeder to apply a common roller with equal firmness from the fingers to the arm and above the elbow, he could not, and I presume no one understanding the circulatory system could expect under these circumstances, a condition of the venous system favourable to the loss of blood by the lancet. If then a congestion in the blood-vessels is prevented by the regular application of the bandage to a part; if in place of too much there is actually a diminished amount of blood circulating in the part under the influence of compression, then in place of operating as an excitant, the bandage

will be proven to be the most successful, and the most powerful agent in checking and subduing inflammation.

The muscular system is very much under the controlling influence of the bandage. In cases of general debility and relaxation, gentle compression by contributing to healthy circulation has a prominent influence in imparting vigour to the muscular system. Of this the labourer in the harvest fields and meadows is well apprized, who binds his loins with ropes of straw in order to sustain the muscles of those parts under the influence of exertion. But while this fact is familiar to the husbandman, every youth who delights in athletic exercises is warned by experience against the prostrating influence of ligatures drawn firmly around the limbs or body. The violent contractions of the muscles in the latter case make it necessary to remove all pressure in order to secure the benefits of a free circulation under the influence of great and transitory exertion. The sufferer in angina pectoris, a disease consisting in an ossification of the coronary arteries, by which the heart is reduced to a condition similar to what is produced by pressure upon a limb, is warned against the direful consequences of all unusual excitement at the source of circulation. Moderate action of the heart, or of the limb bound with bandages, is not incompatible with the requisite circulation to the parts; while powerful muscular contraction in either case, must be succeeded by momentary inaction because of the obstructed circulation.

Hence it appears manifest that the disposition to muscular contraction is easily and speedily subdued by a force that is regular and moderate in character; nor is the power of the bandage, which is necessary to control the muscles of a limb, hostile in any shape to the healthy condition of the other sub-systems which for the time may be placed under its influence. Even in cases of fracture where great muscular contraction has already taken place, the influence of the bandage is not less beneficial. Relaxation is the invariable result of continued resistance to muscular contraction. In this fact is to be found an apology for the use of the bandage in all stages of fracture, whether inflammation be present or not.

The influence of the bandage upon the cellular system is possibly more decisive than upon any other part of the body; and it is probably in this particular, that the bandage will ultimately be the more esteemed as an efficient agent in the hands of the surgeon. Œdematous swellings, deep seated inflammations, fistulous abscesses, together with all those deep seated abscesses which are consequent to amputations and other species of local violence, as well as others proceeding from constitutional causes, are seated in the cellular system. The influence of the bandage in discussing every species of intumescence of the cellular system, whether proceeding from constitutional causes or local violence, is only equalled by its extraordinary power in preventing every species of swelling in this sub-system, and in curing every case of fistulous ulcer on which it can be made to act. Upon a correct knowledge of the influence of the bandage on the cellular system, will be founded some very important improvements in the treatment of sprains and dislocations, as it is by effusion and subsequent inflammation in this system that the principal danger is produced.

Although the medullary system, including the brain and nerves, is less subject to the influence of mechanical pressure, under ordinary circumstances, than most other portions of the human body, still even this affords cases of a most remarkable character, calculated to establish the paramount claims of the bandage to the attention of the surgeon.

Morbid sensibility is checked; spasmodic affections of the muscles proceeding from a morbid condition of the medullary system are controlled; epileptic convulsions the consequence of a morbid sensation in some nerve of one of the extremities, are suspended by the bandage. Fungus cerebri, as well as fungus testis and fungus upon all other suppurating surfaces, is cured with more facility and more certainty by means of pressure than by any other remedy. The influence of morbid pressure upon the brain is most varied and extensive; not an organ in the system remains free from its consequences, while every symptom belonging to the catalogue of human maladies might occur in the history of the case.

The capillaries, the veins, the absorbents, the secretories, the glands are all liable to be controlled to a very great extent by mechanical pressure: but as what has been said on the influence of the bandage upon the skin, the arteries, the muscles and the medullary system, may suffice in this place to enable the reader to form a tolerable conception of its agency upon other parts of the body, it is proposed to pass on to another topic.

No surgical author, with whose writings I am acquainted, has suggested the bandage as an appropriate application in gun-shot wounds. These constitute a species of injury, which is according to general and to the highest authority, peculiar in character; and consequently demand a treatment appropriated to them exclusively. The admission that all gun-shot wounds must necessarily inflame and slough, throwing off thereby that which is insusceptible of preservation, involves an error in the practice of surgery, to which may justly be attributed the loss of thousands of lives, which under the influence of other principles and practice might have been saved. So far as I am capable of judging from my own experience in gun-shot wounds, there is no substantial difference between them and wounds inflicted in any other way, except in the degree of violence done the wounded surface: consequently the treatment should not consist in the difference of remedies, but in the greater promptitude with which the ordinary means are resorted to.

The parts through which a ball has passed, having greater violence done them than would be inflicted by a small sword or bayonet in a wound of similar extent, are naturally more inclined to run into violent inflammation followed by sloughing: hence the surgical axiom that "gun-shot wounds must slough, suppurate and heal by granulation." In observance of these views the propriety of preserving the orifices of the wound free and open is inculcated; while great solicitude is experienced that the whole tract of the ball may be kept open. When the orifices are permitted to close, it occasionally happens that deep seated abscesses form in different parts of the limb, which are quite as difficult to manage under the common treatment as the original wound. The propagation of this erroneous princple,

founded upon false views, as well in relation to the wounded surface as to the applications most advisable in wounds of this description, has done great mischief as will appear manifest to all after a full and fair trial by the bandage.

In the fall of 1817 in an affair of honor, Mr. H. P. received the ball of his antagonist in his right thigh, which passed through both limbs about midway between the knee and hip. The direction of the ball through the right limb was a little anterior to the bone, while in the left it passed through the flexor muscles and wounded the femoral nerve. The femoral artery of the right limb was opened. From both orifices of the wound arterial blood projected to the distance of two or three feet in a stream as large as an opening made by an ounce ball would permit. Although I was within a few feet at the moment and gave him immediate assistance, yet he was in the act of fainting; and except from the instant suppression of the hæmorrhage, it appeared that he must have expired in less than five minutes. My thumb pressed firmly upon the femoral artery where it passes the pubis, checked the bleeding immediately. So soon as assistance was afforded, a common roller was applied with great firmness from the toes until it passed the knee. A compress of some thickness was then placed on a line corresponding with the direction of the femoral artery, and over this the bandage was continued, taking care by a few oblique turns, to leave the two orifices of the wound but superficially covered, while the bandage was securely fixed by making a few turns successively around the hips and the superior portion of the thigh. Upon removing pressure from the artery in the groin, not a drop of blood escaped. A severe shower of rain coming on at this moment made it necessary to place the patiert in a carriage, and remove him a few miles to his lodgings without delay. As there was no hæmorrhage, on reaching his room it was determined not to disturb the dressing on that limb; and the other limb, which had been neglected, was now dressed with a common roller from the toes to the groin. On visiting the patient the following morning, great complaint was made of the left foot and leg, the muscles of which were spasmodically affected; while

the right remained free from all uneasiness, and showed no disposition to bleed.

In the evening the right limb continued to be favourably situated, while the left tormented him to such a degree that I was induced to leave instructions for a large dose of laudanum to be taken at bed-time. For ten days in succession it appeared absolutely necessary to keep him under the daily use of large doses of laudanum, notwithstanding which it continued excessively painful. The bandage had been daily removed as high as the knee, with a view to friction, warm bathing and the application of various remedies to the foot and leg.

On the tenth day the superior portion of the bandage was removed, when it was ascertained that the wound throughout had united by the first intention. The right limb continued through all this time free from pain and uneasiness; and considerable solicitude being felt about the circulation of the limb in consequence of the great artery having been divided, the bandage was cut immediately opposite the anterior tibial artery on the instep and the posterior behind the ancle. No pulsation could be discovered in either of these arteries. An additional bandage was immediately put on the foot and ancle in order to prevent pain and tumefaction, which would otherwise have resulted as a consequence of interrupting the first.

On the next day, being the eleventh from the day of the wound, the superficial bandage of the foot and ankle was removed and there was still no perceptible pulsation in either artery. The appearance of the foot, however, satisfied me that a healthy circulation was going on in the limb.

On the twelfth day the bandage was again removed from the foot, at which time there was evident pulsation in both vessels.

On the fourteenth day the entire bandage was removed from the limb, when it appeared that the wound had united by the first intention, except at the entrance of the ball, where there was a slight suppuration by reason of a small defect of skin. This healed in a few days, so that by the eighteenth from the injury he was enabled to take exercise. The left limb continued to distress him to very great excess for many months in con-

sequence of the injury done the nerve; nor had he entirely recovered the third year after when he left this country.*

Two other cases of a similar character with the above have been reported to me; the one proved fatal in a few minutes by hæmorrhage, the other in four or five days.

In August 1821, a servant while improperly engaged in his neighbour's premises, received a wound with a rifle ball, which passed through the bones of the wrist and lodged in the extensor muscles of the right thigh. Notwithstanding the loss of a large quantity of blood, he walked four miles to town and waited six hours before he was dressed. When the hand was cleansed a small portion of the os magnum was extracted. One of the tendons of the fore-finger was divided by the ball. Separate bandages were applied to each finger, and over them a roller, which was continued upon the hand and wrist, and secured two compresses of some thickness, placed one immediately over each orifice of the wound. The wound in the thigh from which he had bled copiously, was cleansed and dressed with a common roller applied firmly from the toes to the hip. On the tenth day the dressings were removed. The wound in the hand had completely filled, each orifice being designated by a small deficiency of integument, but perfectly healthy in character. The wound in the thigh had also closed without any suppuration. At the third dressing, which was about eighteen days from the reception of the injury, the boy was perfectly well, each wound having healed by the first intention.

Mr. B. a merchant of a neighbouring state, in the year 1822, was accidentally wounded with a pistol, the ball passing through the carpus. The surgeon in attendance adopted the treatment inculcated in the books. Violent swelling and inflammation came on, which did not subside for four months. After that time

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*Baron Larrey mentions a case of gun-shot wound in which the carotid artery was opened, which was successfully treated by plugging up the wound with cloths; and Mr. Abernethy used to relate a case of wound of the axillary artery in a sea-captain, from a splinter during an engagement, in which the hæmorrhage was checked by pressure until the eighteenth day, when from a violent motion of the ship the patient was thrown from his birth on the affected shoulder, the artery was reopened and the patient died.

it was occasionally swelled and painful. Nine months after the injury was received he applied to me for assistance. Upon examination two of the carpal bones were carious: these were principally removed, and then by exciting healthy suppuration the hand soon got well. There is reason to believe that if the bandage had been judiciously used immediately after the wound was inflicted, the patient would have escaped most of his suffering, and been well in twenty days. Swelling and inflammation are the great source of mischief in these cases, and while the bandage effectually secures the patient against both, he is also in a very great measure preserved free from all pain. In some rare cases when the principal nerves are wounded, although the bandage fails to afford ease, yet it secures the part against swelling and inflammation, and thereby prevents any aggravation of the suffering.

A young man had his arm broken with an ounce ball shot from a pistol, which fractured the bone about two inches from the elbow and separated the condyles of the humerus from each other. He was dressed immediately with a roller extending from the hand to the shoulder. The unevenness of the elbow joint makes it impossible to apply the bandage with uniformity; in consequence of which, the patient suffered much from pain in that joint. Such a case is thought by many to require amputation; by almost all, some defect in the joint would be anticipated; and yet by means of the bandage the limb was perfectly restored in a few weeks, the condyles being united by bone.

A servant man, while in the act of retreating, received a musket ball in the inferior part of the thigh, which came out near to and on one side of the knee. A bandage was immediately applied reaching from the toes to the hip, in order to prevent swelling and preserve the muscles quiescent. On the eighth day when the first dressings were removed, the wound had united throughout; and by the twelfth, the patient was perfectly well.

A remarkable difference in the result of the practice here stated, from that which usually attends gun-shot wounds treated after the manner inculcated by the best authorities, must be

conceded by every one at all conversant with the practice in this department of surgery.

A gentleman was accidentally wounded with a musket wad in the muscles of the fore-arm, about three inches below the elbow, and notwithstanding the treatment adopted was, as I have reasons to believe, in accordance with the best authorities of the age, yet great swelling and active inflammation ensued, which terminated in sloughing, deep seated abscesses, and lastly anchylosis of the elbow joint. I saw the patient twenty days after the injury was sustained, and when the fore-arm appeared distended throughout with purulent matter.

No doubt can be entertained, but that this gentleman might have been cured in a week by the judicious use of the bandage; whereas he was confined several months and lost the use of the elbow joint.

A gentleman in this country was shot in his hip with an ounce ball, that passed through the glutei muscles, and penetrated the ilium just above the sacro-sciatic notch.

Having penetrated the cavity of the pelvis, there are reasons to believe that it wounded the rectum and sacral nerves, as he discharged blood and complained of great pain and irritation in the part. The physicians in attendance were under the impression that the ball could be felt buried in the substance of the bone; and some months after, when the patient was thought to be deranged because of the irritation kept up by the foreign body, an operation was commenced with a view to the extraction of the ball, which however was not completed for fear of hæmorrhage. Several months now elapsed without any thing being done, the patient being under the influence of lunacy, with great intellectual excitement. Finally he was brought to Lexington with a view to the extraction of the ball. A fistulous opening, above and a little behind the trochanter major, led to a protracted deep-seated disease. Through the urgent solicitations of others, and not from a conviction of the propriety of the operation myself, I consented to make an effort at the extraction of the ball. After the necessary preparation, an incision was made corresponding with the gluteus externus, of

four inches in length. The gluteus medius was divided for about two inches, running in a direction upwards from the sciatic notch, by which was exposed several branches of the gluteal artery. About one inch above the sciatic notch, the probe passed a hole made by the ball, and when it had reached well into the cavity of the pelvis, it occasioned suffering apparently of the most agonizing character. Being now satisfied in regard to the nature of the injury, the wound was cleansed and by stitches and adhesive plaister, the lips were retained in contact; so that at the expiration of three weeks, it had united completely. The most interesting portion of this patient's history, is the recovery of his reason with the healing of his wound. What agency the operation had in the restoration of his reason is quite unknown.

In 1822, Mr. T. was wounded with a musket, the ball of which entered a little above and anterior to the trochanter major, and rested on the corresponding portion of the dorsum of the ilium. So soon as the wound passed through the ordinary process of inflammation and sloughing, the ball dropped from its situation, and came away at the external wound. Instead of closing, the wound continued open for several years, discharging from time to time, small portions of bone. Finally it healed with some shortening of the limb. With perfect quiet, aided by the prompt use of all the means, constitutional as well as local, that are calculated to check the progress of inflammation, this patient should have been restored to good health in a few weeks.

Mr. E. of Arkansas was wounded severely, two balls having entered anteriorly and ranged deeply through the gluteal muscles posteriorly. One ball was extracted, the other continues in the part. After the most tedious and severe suffering for two years, he came to Lexington with a view to submit to an operation. The fistulous opening had occasionally healed, but always with a great increase of suffering and an extensive suppuration among the muscles. This taught him the propriety of keeping up a constant drain from the surface by means of particular dressings. In this way his sufferings were mitigated,

but to no considerable extent. No evidences had been given at any time of an affection of the bones in that vicinity. Inasmuch as the sufferings of the patient did not involve any of the bones of the pelvis, and as strong apprehensions were entertained that the condition of the general system, which was extremely disordered, constituted the source of all his sufferings in the region of the wound, he was encouraged to let the ulcers heal, while general remedies were directed to his constitution.

After treating the case for two or three weeks it was satisfactorily ascertained that the constitutional affection, which consisted in a highly deranged condition of the liver, spleen, and digestive organs generally, constituted the great source of his suffering. With this discovery before us, the patient was induced to spend some time in this country, and to use from time to time, as occasion called for them, those medicines which exert a corrective tendency on the chylopoietic organs. The consequence of this treatment, with a temporary change of climate, was entire relief to his hip, and a perfect restoration of his general health.

These cases are given by way of contrasting the effects of the ordinary treatment with those of the bandage. There can be very little question, from the result in the preceding cases, but that those cases were susceptible of cure in a few days by the bandage; whereas in each, morbid excitement and suppuration were protracted in the site of the wound for several years. One of them remained evidently local throughout its entire history; the others were constitutional in the origin of most of their symptoms, after the first effects of the wound subsided. The progressive history of each was marked with a peculiar class of symptoms, notwithstanding two of the cases were prolonged by constitutional derangement. That all-pervading law which causes particular parts and organs to suffer for the general system, is not more manifest in any species of local violence, than in those under consideration; and if the bandage possesses the power of preventing the acute and violent symptoms consequent to gun-shot, as well as other wounds (as it certainly does in our hands,) it will be proven to possess most com-

manding influence in curtailing the force and reducing the number of human maladies.

The very common practice of amputating limbs, because of compound fracture by gun-shot wounds, will be suspended when the bandage is properly appreciated. In several cases within my own practice, I have reduced them to the condition of a simple fracture, and have thus managed them with the same facility as in other instances where similar violence has been done in a different way.

Independent of the influence of the bandage in reducing a gun-shot wound to a state of simplicity equal to that of other wounds, so far as regards the suppression of inflammation and sloughing, it possesses the admirable quality of preserving the parts free from liability to those deep seated abscesses, which are so frequently the consequences of inflammation following this description of injury.

Nor is the safety of the patient against secondary *haemorrhage*, by reason of the influence of the bandage, a consideration unworthy the attention of the profession. Every one is apprized of the solicitude experienced by the surgeon, patient and attendants, in those cases wherein a ball has passed through the immediate vicinity of any of the large blood vessels, until the process of sloughing is completed, the granulations healthy, the wound contracting, and thereby the blood vessels rendered safe. On the contrary, however near a ball may have passed to a large blood vessel; however free it may have cut its cellular connexion with adjoining parts; notwithstanding it may have destroyed the superficial coats of the vessel; yet under the controlling influence of a well adjusted bandage, no fears need be entertained in regard to the safety of the patient. In confirmation of this it is only necessary to recur to a series of experiments on the vascular system made by Jones and his successors, by which it was made to appear that the removal of the exterior coats of a vessel does not destroy its circulatory power.

The superior efficacy of the bandage over all other topical applications in the cases before us, rests on some established principles involved in inflammation, principles that are universal-

ly received as true by the intelligent part of the profession. It is admitted that in every gun-shot wound, there are fibres in the tract of the ball, which are killed at the instant the injury is received; but in this admission, it is by no means yielded that the processes of inflammation, sloughing, suppuration and granulation are necessarily involved in the cure. No wound, whatever the instrument, can be inflicted on the system, in which there is not a destruction of fibres; and every professional man has cases of wounds and even those of magnitude, in which a union by the first intention has been effected. The real difference then between a clean cut, a contused or lacerated, and a gun-shot wound, consists in the number of fibres destroyed; and consequently there should be no difference in the practice except in the energy and the promptitude with which the application is made.

A bandage passed firmly around the entire limb, so as to place all points of the wounded surface under a degree of pressure sufficient to prevent tumefaction, or an accumulation of blood, cannot fail in every possible variety of case, to preserve the patient free from inflammation. Under these circumstances, those fibres that are killed are immediately removed; while another action, which consists in the direct restoration of the parts, is simultaneously set up. The animal ligature of Professor Physick is esteemed valuable because of its susceptibility to be acted on by the absorbents. The tedious process of throwing off the ligature by suppuration, when it becomes necessary to tie a vessel, is thereby superseded. With what additional facility the lacerated surface of a wound is susceptible of removal by the absorbent vessels, when placed under favourable circumstances, can be readily imagined by those conversant with the varied and extensive influence of this sub-system.

The capacity of the absorbents to remove those fibres within the tract of a ball which are insusceptible of resuscitation, will scarcely be questioned by the physiologist who turns his attention to the powers of this system in other cases. A dead bone, collections of pus, dropsical secretions, and all the fluids as

well as the solid parts of the body, are ever liable to be acted upon by the absorbents.

But if these facts be insufficient to secure the confidence of the practitioner, then let him select a favourable case of gun-shot wound in one of the extremities and rely upon the efficacy of a well adjusted bandage, whereby the entire limb is placed under the influence of regular and equable pressure. The result of the experiment faithfully performed will be decisive, and he will then learn to appreciate the importance of the remedy in army, naval and hospital, as well as private practice.

It might be imagined that the presence of foreign bodies in a gun-shot wound, would constitute an objection to the use of the bandage. Such an event however constitutes an additional and very strong argument in favor of mechanical pressure. It is at all times desirable to remove extraneous substances from a penetrating wound, inasmuch as they tend to aggravate very highly the disposition to extensive swelling, inflammation, and deep-seated abscesses: but where this cannot be effected, the bandage will, when properly applied, preserve the parts free from tumefaction, and to a very great extent from pain and suppuration also.

The partial suppuration which supervenes in these cases, tends to approximate the foreign body to the surface, while in every possible respect the condition of the patient under the influence of the bandage is more compatible with ease and safety.

The integuments and superficial parts are not so directly under the influence of the absorbents as the deep seated parts of the body, and cannot be treated with the bandage as successfully after injury by gun-shot. In injuries of this description the constitutional as well as the local symptoms are sometimes inclined to run high. By preventing all tumefaction the integuments which are destroyed come away in the dressing, leaving a healthy suppurating surface beneath. Nevertheless extraordinary advantage is to be derived from the use of the bandage even in these cases.

Master S. had the fore, middle, and ring finger shot off at the

second joint and remained two hours without any dressing. After being properly cleansed and some ragged portions of the stumps removed, the integuments were placed as much as practicable over the ends of the bones and retained by means of small bandages adjusted to each. The pain, which had been severe for an hour, subsided so soon as the dressing was applied, and he never had a moments uneasiness after. On the tenth day after the injury the dressings were removed, when union by the first intention was complete where the integuments had been drawn in contact; while the other parts were devoid of all inflammation, and were healing by granulation. After the application of the first dressing this youth did not experience a moment's uneasiness in his hand during his recovery.

The following case differs from most others because of the peculiar liability of the parts involved, to high degrees of inflammation and sloughing. A large bullet passed between the urethra and corpora cavernosa, opening each of these three bodies; passed through the scrotum of one side, laying bare the testis and spermatic cord; cut away a considerable portion of the skin from the front of the thigh, entered the wrist just below the radius, and made its exit a little below the styloid process of the ulna without injuring either the extensors of the hand or the bones of the wrist. A bougie passed into the urethra came out at the wound. Dressings were immediately applied, taking care to use pressure wherever it could be made to the different wounds: this aided by warm and steam bathing prevented much inflammation or swelling.

The patient however suffered intensely during the first day and night, but never after. The wounds of the wrist, cavernous bodies, urethra and scrotum healed by the first intention, except a slight suppuration from the latter. No urine passed the wound after the first dressing.

When the patient had recovered, a slight contraction of the urethra at the seat of the late wound was manifest and caused some inconvenience. This was relieved by the bougie, as the patient has long since ceased to make any complaint.

In all those cases of violence in which destruction and sepa-

ration of the dead from the living parts must ensue, the bandage exerts a happy influence by preventing all intumescence, and by promoting immediately, through the agency of ulceration, a disjunction of the dead and living parts. Under this particular head, evidence conclusive in character will be presented when on the subject of compound fractures.

From the preceding observations on gun-shot wounds it must be evident, that the principles inculcated are designed to be applied especially to the limbs, and such other parts as can be controlled by mechanical pressure: yet they are not without their value in regard to the chest and abdomen. A wound penetrating either of these great cavities is more successfully treated with the bandage, which, in preserving the wounded muscles, fasciæ and integuments quiescent, cannot fail to exert a happy influence on the organs within. The resources of nature in securing the healthy performance of the functions of the lungs are various. Under ordinary circumstances, the muscles of the chest and abdomen, including the entire trunk, are tributary to the process of respiration; yet nature is capable of sustaining herself when one half of this influence is cut off. In acute inflammatory affections of the pleura, the process of respiration is performed independently of the intercostal and other muscles that act especially on the thorax; as in a similar condition of the peritoneum, the muscles of the abdomen are held tranquil, while those of the chest are perceived to act with preternatural force. With these physiological facts before us, even without the benefit of experience, it would seem most rational that in all wounds of the abdomen or chest, bandages should be applied with a view to aid nature in preserving the wounded parts perfectly quiescent. Besides the advantages arising out of a more certain and speedy restoration of the wounded parietes, a proportionate beneficial influence, by no means equivocal, is extended to the wounded organs within. Hæmorrhage is sometimes checked, while the contents of the cavity are rendered less liable to tumefaction and consequently to mortification.

In recommending the bandage, it is not designed to arrest the exit of blood through the external wound, which would occa-

tion an accumulation within; on the contrary it is advisable to encourage the discharge from the cavity, of the whole of the blood which may have escaped from the wounded vessels. An accumulation of blood in the cavity of the chest will, by its mechanical influence, tend to arrest the progress of hæmorrhage, and thereby place the patient in a state of apparent security. It is however a fatal deception, since the patient is generally destroyed by low fever some days after.

English, French and American authorities differ in the treatment of fracture. One party prefers that position of a broken limb which secures the greatest relaxation of all the muscles involved in its various movements; another esteems the greatest improvement in this department of surgery, to consist in the apparatus calculated to secure permanent extension; while the third, ever ready to abandon old opinions for others promising more practical utility, has suggested a variety of plans, without yet having settled down in any system of practice, which secures the approbation and support of professioual men. The great practical surgeon and pathologist of England, Mr. Abernethey, inculcates as a principle of practice in his lectures, that it is only necessary to extend the broken limb two or three times a day, in order to secure it against any morbid contraction of the muscles, and correspondent shortening of the bone; while other practitioners find it difficult to preserve the natural length of the limb with all the advantages of an apparatus combining the powers both of extension and counter-extension, in uninterrupted operation. In England it is especially recommended that no attempts at extension and no application of the bandage be made, until by cooling embrocations and mild poultices, together with such constitutional treatment as the case may require, the local symptoms of pain, inflammation, &c. have in a great measure subsided. Experience most ample and conclusive, in regard to the superior efficacy of the bandage over all the plans of treatment that have been suggested for every species of fracture, does not permit me to hesitate on the propriety of recommending it, without regard to time or circumstances; inasmuch as it secures advantages which belong to no other

plan of treatment that has been suggested. By a recent notice in the American journals of medicine, it appears that the great military surgeon of France, baron Larrey, has introduced the use of the bandage to the exclusion of all other dressings in cases of fracture.

It is believed that the addition of an adhesive unguent to the bandage, as recommended by the baron, will be found not only unnecessary in any case, but positively objectionable in some, and always tending to exclude the surface from those daily observations that the surgeon is pleased to make, where either much interest or great doubt is entertained about the termination.

If the roller be thoroughly wet in a vessel of spirits *before it* is applied to the limb, its various turns will, when dry, adhere closely to each other, and thus the limb will be included in an unyielding sack, securing equable and regular pressure upon all points of the surface. The superior advantages of wetting the bandage with spirits, in place of spreading adhesive unguents upon it, consists in the greater cleanliness, a quality of particular interest to the patient who is confined for several weeks to bed. In compound fractures it has a decided preference, because of the facility given to the escape of those fluids which must pass through the dressings in greater or less quantity; otherwise they will excite ulcerative action in the integuments, and adjacent parts. When bandages of very close texture are applied in too many layers over a compound fracture, it frequently happens that they will, by confining the morbid secretions upon the limb, produce similar pain to that which occurs in the early stage of an abscess. If then such occurrences are observed occasionally under the use of a clean bandage, how much more liable will the patient be to similar results where the bandage is rendered impervious by adhesive unguents? But in place of discussing the propriety of adding an unguent to the bandage as practiced by baron Larrey, it is proper in the first instance to show the advantages to be derived from the bandage itself. Truth must ultimately prevail. Every student who has been in this institution within the last ten years has been furnish-

ed with facts and evidence in favor of the efficacy of the bandage. Every student who has written me on the result of its application in practice, has furnished testimony to its superior efficacy, even when applied in those cases wherein the most distinguished men of the age have condemned it as mischievous.

The partial and incomplete mode of using this, like many other agents in the profession, is calculated to do mischief. It does not follow however that the abuse of any agent can be urged as an argument against the skilful application of it. Mr. Abernethey was accustomed in his lectures on surgery to recite a very interesting case of fractured patellæ which came under the care of Mr. John Hunter, wherein the bandage might have rendered the most essential service.

The patient, a lady, had fallen down a flight of stairs and fractured transversely both patellæ. Having been confined several years to bed as a consequence of the injury, Mr. Hunter was finally consulted. Upon examination, that gentleman ascertained that the superior fragment of each bone was drawn up as high as the middle of the limb, while the lady was incapable of exerting the extensor muscles of the limb with the least perceptible effect. Under these circumstances she was seated upon a table, while her lower limbs were made to vibrate like a pendulum. In the beginning of the experiment no volition could be exercised by the patient in preserving the movement of her limbs. After some days however, the experiment being kept up for half an hour at a time and repeated three times daily, she regained so much command over the extensor muscles, as to enable her when the movement of the limbs was commenced, to keep it up by an effort of the will. She then speedily gained sufficient control over the muscles to commence the motion herself, and before the expiration of a month she was enabled to walk through the house.

In a case of fractured patella, we are instructed by Sir Astley Cooper to place the patient in bed with the limb extended, and to make use of evaporating washes and mild poultices, as local means, until all irritation, swelling and inflammation have subsided. Then we are directed to pass a band

above the superior, and one below the inferior fragment of bone, with a view to their approximation. Particular cautions are given in regard to the mischief likely to ensue when the bands are applied too early, since they are calculated to re-excite swelling and inflammation. Sir Astley Cooper further observes that in these, as in all other cases of fracture communicating with the joints, union is not effected by bone; and that in place of it ligament becomes the medium of connexion. Many experiments performed on animals, and many observations made on the human subject, have satisfied Sir Astley, that ossific union cannot be effected within the capsules of any of the joints. Although this authority is of the highest order, and notwithstanding the science of surgery is so much indebted to Sir Astley Cooper, yet it is confidently believed, it is even positively asserted, that the principle is untenable, while the practice growing out of it is defective and unsafe.

A gentleman, Mr. R. of Charleston S. Carolina, in descending some steps fell and fractured his left patella. I saw him in half an hour after when there was no tumefaction, while the space between the two fragments of bone was equal to the width of my hand. The limb being in an extended position, a bandage was firmly applied from the toes to the knee and fixed there by a pin. Another and a wider bandage was fastened around the hips, and when by means of assistants the superior fragment of bone was drawn down and placed in contact with the inferior, the upper bandage was firmly applied to the thigh from the groin to the knee. Then by successive turns of the two rollers, a perfect coaptation of the two fragments was effected and they were thus immoveably fixed. On the tenth day from the accident, the bandages having become loose from the absorption of the cellular substance, and failing to give sufficient protection against muscular contraction, were taken off and immediately re-applied. On the twenty-fifth day, after three dressings, the patient was perfectly well, without a line of difference between the patella of the right and left side.

Just after the conclusion of the fourth week he left town with a view to go to the state of Illinois. In crossing the first brook,

distant about four miles from town, he dropped his glove. Leaving his gig, he made a severe leap to recover his glove and thereby re-fractured his patella. Several hours after this accident he returned to town with a remarkably swollen knee. The bandage was applied as at first. It was necessary however to re-apply it daily for about five days before the tumefaction was reduced. At the end of a month he was restored a second time; but there was now a difference between the two knees, by reason of the amount of bony deposit which rendered that recently fractured larger than the other. I have had two other cases of this character treated with like success. From Dr. Preston of Virginia, and Dr. Davenport of this state, both eleves of this institution, I have advices of the successful use of the bandage in procuring ossific union in fractures of the patella. In another part of this paper I have stated a case of fracture of the os humeri, about two inches above the elbow, attended by a longitudinal fracture which separated the two condyles, in which an ossific union of the condyles was effected by means of the bandage.

In a case of downward luxation of the elbow joint, attended by a fracture of the olecranon process, similar success attended the use of the bandage; and I have strong reasons to believe in the success of the same treatment in two cases of fracture of the neck of the os femoris, but of this I have no positive testimony. Sir Astley Cooper ascertained by experiments upon animals, that a longitudinal fracture of the patella will unite by bone, and it is a little remarkable it should not have occurred to that gentleman, that a transverse fracture of the same bone would as certainly unite in the same way, provided it were placed under circumstances equally favorable to union. When the contractile disposition of the extensor muscles connected with that bone is suspended, and when the two fragments are retained in immediate apposition by means of the bandage, there can be no reason why a transverse will not unite by bone as readily as a longitudinal fracture.

The reason why the union is ligamentous under the ordinary treatment is obvious. The swelling and inflammation that su-

pervene in those cases, is attended by copious secretion which is interposed between the fragments of bone, thus presenting a mechanical obstacle to their coaptation, at the moment when mechanical power is resorted to for the purpose of their approximation. It would seem to be matter of astonishment that the intervening ligament is so short, when it is understood how far the divided portions of bone are drawn asunder, and how copious the secretion filling up the interspace. It is evident there can be no displacement of bone, neither tumefaction nor inflammation, except what may be necessary for the purpose of reunion, where the bandage is properly applied. Under its use the patient may rationally anticipate a confinement void of pain, and a recovery more rapid than when managed in the ordinary way. All the pain, swelling, inflammation and retraction of muscles, which follow fractures under the usual management, are prevented by the judicious application of the bandage. The idea entertained by some who know nothing of it by experience, that it is calculated to produce mortification, is founded upon a superficial and false view of the subject. Daily observation going on proves that it has no tendency to excite, but exerts a very powerful one to prevent mortification. Those who recollect Mr. John Bell's remarks on the strength of arterial circulation, would never imagine that a bandage drawn equably and including the entire limb could predispose to mortification. I have frequently applied the bandage with so much force to a limb as to cause it to move perceptibly with each pulsation, and give the sensation of the artery when the hand was placed on the bandages upon the outer side of the thigh, as distinctly as the pulse can be felt upon the wrist.

In compound fractures there is nothing equivocal in the influence of the bandage; since it possesses more power in restraining morbid action, than all other means, constitutional as well as local, combined. When the violence is so great as to be incompatible with the preservation of the parts, a separation of the dead from the living takes place without tumefaction, and in a much shorter space of time than under ordinary treatment.

Mr. B. was thrown from his horse and fractured his leg a lit-

tle below its middle. The superior fragments lacerated the soft parts, and the end of the tibia buried itself in the ground. A temporary dressing was applied at the time, which was removed on the following day and the bandage carefully put on. In consequence of the swelling, it became necessary to re-apply the bandage daily for four days in succession.

When by means of the bandage the tumefaction was subdued, an aneurismal tumor based on the anterior tibial artery, of the size of the end of a man's thumb, presented itself in the wound. Immediately over this tumor compresses sufficient to secure effectual pressure were applied, and then the roller was securely put on from the toes to the knee. In eight days from this time the tumor was cured, and by the twenty-fifth from the day of the injury, the patient was on his crutches, the bones and soft parts all having perfectly healed.

In my remarks on gun-shot wounds I have given several cases of compound fracture, wherein the cure was effected with equal facility by means of the bandage. Were it necessary to swell this paper I could report more than a dozen cases of compound fracture cured by the bandage with the same facility as though they had been of the simple species. It is rather a singular fact that I have never been unsuccessful in restoring my patient's limb, who had been the subject of compound fracture, whether from gun-shot or otherwise; while in four instances in eighteen years practice, I have found it necessary to amputate in simple fracture by reason of the injury done the nerves and blood-vessels.

In simple fracture the bandage is invariably successful provided the parts on which depends the vitality of the limb are not destroyed. In eighteen hundred and nineteen a man while running his horse in one of the lanes adjoining this town, was thrown upon a stump and fractured one thigh in two places; the one a little below the trochanter major, the other about three inches above the condyles. When I reached him the limb was resting in form of a semicircle, the fragments of the bone pointing to the superficies. By extension and counter-extension for some minutes the muscles of the thigh yielded and the limb be-

came straight. A bandage was then applied with firmness and uniformity from the toes to the knee, and when upon examination the fragments of bone appeared to be perfectly in place, extension and counter-extension being continued, the bandage was carried over the fractures and by several turns fixed securely around the hips. After this, two splinters drawn off from the rails of an adjoining fence, were bound upon the limb. The patient was now put into a dirt-cart and taken ten miles into the country, where he was ordered to remain quiet until the bandages should become loose.

On the ninth day I was sent for, and from the extent of cellular absorption, it became necessary to remove the loose dressings and re-apply them. On the eighteenth day I re-applied them a second time. The patient doing well, I left him in the hands of a member of the family, who put him on his crutches in a week after.

A black woman fractured the central portion of the os femoris by a fall in our streets. She was immediately dressed with a roller extending from the toes to the upper part of the thigh, and secured by several turns around the hips. On the tenth day after it was dressed a second time, and again on the twentieth the bandage was put on for the last time. Before the thirtieth day she was on crutches in the streets.

A boy while running a horse through the woods was thrown against a tree and fractured his leg near the middle. Being eight miles in the country, some tumefaction of the limb occurred before I reached him. After the limb was bathed for some time in warm spirits, it was extended and dressed in my usual mode with the bandage.

On the third day the bandage being loose from the subsidence of the swelling, one of my pupils visited the patient and re-applied it more firmly; but he had scarcely reached home before a messenger came in haste, to inform me that the patient was in agony and craved relief immediately; otherwise mortification was apprehended. Without loss of time I went out and found him suffering from some irregular turns of the bandage about the instep, which subsided instantly upon taking it off, and re-

applying it with evenness and uniformity. After two more dressings the boy was dismissed well. When the bandage presses irregularly upon the foot, it excites similar torment with the ill-shaped small shoe.

A black man was thrown from an ox-cart and had his thigh broken a little above the middle. By the twenty-fifth day, with three renewals of the bandage, he was well. For four years after he remained strong and healthy. At last his general health began to suffer, his skin assuming an ashy complexion, with pain in the seat of the fracture. He had been out of health with constant pain in the thigh for three or four months, when in walking on an even surface the os femoris parted exactly where it was first broken. It was dressed with bandages as before, and without any complaint on the part of the patient, the foot and all the muscles on the back of the leg mortified, the integuments and muscles in front remaining healthy. After about three months his general health was perfectly restored with the loss of the limb. Had this mortification proceeded from the improper application of the bandage, it would have affected the whole limb below the place in which the stricture was made.

It is generally received as a principle in practice, that where swelling and inflammation have supervened in a case of fracture before the surgeon is called in, the limb must be put under the use of cooling washes and poultices, and the setting of the bone must be deferred until the inflammation is subdued. Hence in cases of oblique and comminuted fracture the fragments are liable to great displacements; nor is this all, every degree of spasmodic contraction of the muscles, by aggravating the displacement of bone the irritating ends of which become increasing causes of muscular contraction pain and inflammation, increases the danger as well as suffering of the patient. The question presenting itself to the mind of the surgeon in such a case, concerns the violence done the patient by forcibly extending the limb and setting the bone on the one hand, and permitting the irregular contractions of the muscles to increase the displacement and consequent suffering on the other.

A youth received a severe contusion and fracture of his leg

by the machinery of a horse-mill, and the physician of the neighbourhood thought it a case in which too much violence was done to set the bones until it had passed through the inflammatory state. The limb was placed on pillows, and the usual applications were made with assiduity for the purpose of preventing inflammation. On the fourth day from the injury, there being much swelling, inflammation and pain, the family became alarmed and I was called in. The leg was very crooked as it lay on the pillows.

By a gentle and continued effort for some time, the leg was drawn straight and then a bandage was immediately put on, as firmly as the morbid sensibility of the parts would admit. The youth was then placed in a carriage and brought to town by his parents. In the course of the evening of the same day, from the reduction of the swelling it became necessary to remove the bandage and re-apply it; and it was dressed daily for four days in succession. By this time the tumefaction was dispersed, and in two weeks more, with three additional dressings, the limb was entirely well.

In several other cases of fracture attended by great swelling and inflammation, I have been equally successful in subduing all the acute symptoms by means of compression, and have thus placed the patient in more immediate safety.

It may be stated as a correct principle in practical surgery, that every case of fracture however extensive the violence done, is susceptible of successful management by the bandage, provided the circulation and sensibility of the limb are not destroyed. The following is a remarkable case wherein the injury sustained was too great to admit of restoration.

A boy while attending to an apple-mill, was induced to try how far he could pass his hand between the rollers of the machine without injury. By pushing the experiment too far, the hand was drawn in, and the integuments, tendons, muscles, ligaments, fascia, nerves and blood-vessels of the palm of the hand were all divided, and the metacarpal bones of the fore, middle and ring fingers were broken up at their junction with the carpus.

The bones of each of the fingers were broken, except the least, which was entirely cut off. In this case, nothing connected the fingers and metacarpal bones to the hand and wrist, but the integuments, extensor tendons, and the few blood-vessels and nerves distributed on the back of the hand. . The great confidence experience had taught me to repose in the efficacy of the bandage, induced me to make an effort to save the fingers. With this view a bandage was put upon each finger. A common roller was then applied over the fingers, hand and wrist, care having been previously taken to adjust the parts involved in the wound. The dressings were removed on the fourth day, when the fingers and the metacarpal bones, except the least, dropt off, leaving the surface of all the carpal bones bare, with the exception of that connected to the metacarpal bone of the little finger; while the soft parts were free from all swelling, healthy and suppurating. The integuments were now drawn over the carpal bones and retained by adhesive plaister and bandage. Not more than three dressings were necessary, and at the end of two weeks the cicatrix was completely formed. By means of the thumb and the metacarpal bone of the little finger, that hand answers well in using the axe, the hoe and the wagon whip. With ordinary surgical treatment this patient must have lost his limb, or have undergone a tedious and hazardous confinement.

That fistulous abscesses are unknown in those cases of fracture wherein the bandage is properly used, is a recommendation of no inconsiderable character. It is an occurrence known to every one of some experience in the profession, that patients occasionally die from great swelling, inflammation and mortification consequent to a broken bone. The fact of the occasional occurrence of extensive, deep-seated and often unmanageable fistulous abscesses, is equally familiar to practitioners, and these constitute the most conclusive argument in favor of the bandage, since they never occur under its influence, however extensive the injury done the soft parts, and notwithstanding the aggravated character of the fracture.

A gentleman of the neighbouring country received a severe fracture of the leg a few inches above the ankle. After five or six months unsuccessful treatment, the patient's general health having suffered to an alarming degree, it was made known that amputation or death was the only alternative left; while doubts were expressed of the result of the operation, in consequence of very extensive fistulous abscesses in the leg and thigh. Under these embarrassing circumstances the patient was transferred to me.

I found the bones of the leg reunited in a way calculated to render but little service in the event of recovery; while the leg and thigh were extensively dissected up by means of fistulous abscesses. A large ulcer was seated just over the original fracture. The application of the bandage three times cured this patient; so that at the end of the second week he left me, taking with him his distorted limb as a living monument of bad surgery.

It is rather a singular fact, that on a subsequent occasion another individual, who had been under my charge for an injury done the head of the fibula, some time after leaving me became the patient of the professional character who had failed in the treatment of the case just recited; and when this very simple case eventuated in the loss of the limb, the patient was taught to ascribe that loss to his treatment while under my charge.

The history of the case is as follows. In attempting to mount his horse the patient was thrown with the inferior and outer part of one knee on a piece of timber. In a few minutes I was called, and upon examination the head of the fibula gave to my hand the sensation of an egg-shell crushing between the fingers. No other part of the limb received the slightest injury. The patient was in great pain, which was attributed in part to the injury sustained by the peroneal nerve. The bandage was applied, extending from the toes until it passed the knee. Notwithstanding a variety of imprudences committed by the patient, in rolling about the bed, in eating and drinking secretly articles of the most injurious kind, whereby two severe

attacks of fever were produced, and in interrupting the dressings; yet about the twenty second day from the injury, he was well enough to leave me and go to the country.

He was not long in the country before I was informed that he was again ill, and that his leg was swelled and painful near the ankle. The individual who could lend the weight of his word to propagate error and do injustice, in a case the history of which affords sufficient evidence in favor of the treatment instituted, only exposes his own weakness and folly to the derision of the intelligent in the profession.

Had the bandage been judiciously continued after leaving me, the patient might have been the subject of fever for months in succession from improper indulgence in eating and drinking, without necessarily losing his limb. Nothing can exceed the folly and the stupidity of the charge against the use of the bandage in that case; the more especially as the patient was well enough after two attacks of fever, induced by imprudence and the injury done his knee and the head of the fibula, to leave town in twenty two days. It must be manifest even with the tyro, that the evil effects of the bandage when they do occur are speedily made known. Swelling, inflammation, deep seated abscesses, suppuration, and sloughing are incompatible with its direct action upon any part. Its tendency is immediately opposed to each of these states of the system. The law whereby constitutional diseases are inclined to spend their force on parts rendered preternaturally weak and excitable by violence or otherwise, seems to have escaped attention. It is from that law a solution of the case in question is to be drawn; while from ignorance or a neglect of it, the patient ultimately lost his limb. By means of the bandage I have been enabled to save more limbs, the removal of which had been determined on by other physicians, than all the cases of amputation together would amount to, in which I have had the least agency, either immediate or otherwise, for the last fourteen years.

A young man in the country employed in machinery, had the metacarpal joint of the forefinger opened, the soft parts extensively lacerated, the first bone of that finger broken, and the

flexor tendons drawn from their situation and standing prominent in the wound. His physician advised immediate amputation. Being unwilling to lose his finger, he rode to town to see me, with a view if possible to preserve it. When the wounded parts were properly adjusted, a bandage was put on the finger and thence around the hand. A second bandage included the whole hand, wrist and fore arm, with a view to prevent all muscular movement. At the end of three days the dressings were renewed. About the fifteenth day, and the fifth dressing, the wound cicatrized and the patient returned home. A more frequent removal of the dressings was necessary in this case, as suppuration took place partially, because the bandage could not be made to act on the entire surface of the wound.

Splints, fracture-boxes, inclined planes, and powers designed to keep up extension and counter-extension, are all resorted to with a view to remedy the evils proceeding from muscular contraction. Baths, evaporating washes, and mild poultices are applied with assiduity in order to check swelling and inflammation. In the use of the bandage the practitioner avails himself of a remedy, which is calculated to preserve the muscles in a state of tranquility, while it is impossible for swelling and inflammation to run to any excess; and thus the entire catalogue of means hitherto in use in cases of fracture, is rendered superfluous. The whole period of treatment for fracture, by the common means, is one of embarrassment and pain. Under the use of the bandage the patient makes no complaint, except what arises out of confinement.

Fractures of the fore-arm constitute a partial exception to the rule laid down for the treatment by bandage, since here it is necessary in addition to the bandage to use means to prevent the approximation of the two bones. A rolled newspaper, or piece of cloth, or semi-cylindrical splint laid on the front of the fore-arm, and pressed between the bones by means of the bandage, is all that is demanded; care being taken to apply the dressings, while the hand is supine, and to roll the bandage from within outwards.

In the leg however, nothing but the simple roller is necessary

in case of fracture; since no separate motion is enjoyed by either bone, and the functions of the soft parts cannot be injured by their approximation. Although I cannot concur with baron Larrey in the use of adhesive matter on the bandage, with a view to cure by one individual dressing, yet I have in several instances seen the fractured limb get well under one dressing; while in every instance the period of confinement is curtailed, the sufferings of the patient lessened, and the attention demanded of the surgeon greatly diminished. As a general remark, four or five dressings will suffice for almost all cases of fracture, while it often happens that half that number will be found to answer. When much swelling has occurred before the dressings are applied, or when the patient is corpulent and of soft fibre, the speedy reduction in the magnitude of the limb, from the influence of pressure upon the absorbents, makes it necessary to dress more frequently. But while fractures are managed with so much facility by the bandage, it is necessary to be particular in its application.

Put on by inexperienced hands, it is often made to press unequally on the ankle, wrist, and upon the prominent points of small joints. Varying degrees of force in its application, and wrinkles from irregular turns, sometimes cause so much pain as to make it absolutely necessary to re-apply it.

There is no other mode of managing fractures of the olecranon with tolerable success than by the bandage. By preventing all tumefaction and inflammation, the first as well as the only effort of nature is made with a view to the re-union of the broken bone; but when by neglect or otherwise, the parts become swelled and inflamed, the bandage must not be delayed. Its efficacious influence is now still more to be desired: possessed of more extraordinary power than any other agent, of subduing inflammation, and thereby preserving the patient from its destructive consequences, it should be resorted to by the surgeon with the more alacrity, as the case is the more critical.

I cannot speak from experience of the influence of the bandage in securing a bony re-union where the condyles of the os femoris have been separated. Cases of this description are on

record where the connexion became ligamentous, and they are adduced in confirmation of Sir Astley Cooper's assertion, that all fractures occurring within the capsules must be restored by ligamentous union. One fact furnished by Sir Astley of bony re-union where the patella was fractured longitudinally, in an experiment upon an animal in which the union by bone was complete, would independently of other information touching this subject, satisfy me of the practicability of effecting a bony re-union between the condyles of the os femoris. The presence of the synovial fluid may have some tendency to embarrass nature in effecting ossific union, and yet a very clear case of ossific union of the neck of the os femoris has lately been published in London. The opinion that the articulating extremities of bones have not a sufficiency of circulation to effect ossific union, is unsound, since there is evidently most circulation in the enlarged extremities of all the articulating bones. The statement made on the subject of the circulation in the neck of the os femoris is not less objectionable. Although, as contended by Sir Astley Cooper, there is no periosteum, yet it must be remembered, that there is another avenue by which an equal supply of blood is secured to this part. The whole inner surface of the capsule of this joint is connected to the neck of the bone by extensive processes of capsule, which go to be attached to its superficies, and to dip deep into its interior texture. These must supply the superficies of the bone with a circulation equal to that of the periosteum. If then it be true that an ossific union of the neck of the os femoris can be effected, the importance of the bandage in preserving all the muscles of the part in a state of perfect quiet is most manifest.

(TO BE CONTINUED.)

ART. IV.—*An Essay on Winter Epidemics.* By JOHN ESTEN COOKE, M. D. Professor of the Theory and Practice of Medicine in Transylvania University.

In a former essay I have endeavoured to point out the origin of the cause which produces autumnal diseases, its effects on the system, and the best mode of obviating them. In the present it is proposed to investigate the causes which produce winter epidemics, and to make a few general observations on the treatment.

In a neighbourhood in which miasmata abound, the whole population is more or less exposed to their influence, and the effects appear in various degrees. Perhaps none escape without having their blood rendered darker in colour, or without becoming more or less sallow; some lose their appetite; others in addition to this have a loathing of food, and a disposition to vomit; many have furred tongue; many, green or dark passages; some have occasional chilly feelings and pains in different parts of the body. All these occur in many persons who are able to attend to their business regularly, and escape severe illness.

These morbid symptoms, in various degrees, continue to affect the whole population throughout the autumnal season. Numbers are becoming ill every day, and at the moment of the access of cold weather, many are still on the verge of an attack. When winter appears the production of miasmata ceases, and the violent winds of that season disperse all that remain in low spots. The cause ceasing to operate, the effects gradually disappear, but not instantly; for we meet in every period of cold weather, with cases in which green or black discharges from the stomach and bowels, and other effects of miasmata, appear.*

*Since the publication of the essay on autumnal diseases, I have had several conversations on the subject with gentlemen who find a difficulty in fully admitting the dependence of those diseases on miasmata. Their doubts arise

When winter sets in there is another remote cause of fever in operation, and in neighbourhoods in which miasmata abound, the population is at the same time under the influence of both these

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from observing that cases of autumnal fever appear at a considerable distance from sources of miasmata.

We conceive that one point at least on this subject is settled; that every man's experience has brought him to the conclusion, that autumnal fever is certain to prevail in the heat of summer along the borders of marshy grounds, not covered with water so as to prevent the full action of the sun. Wherever such a spot is formed by the regulation of streets in a town, by the building of a mill-dam, or in any other way, provided the water does not cover the surface from the full action of the sun, there, in hot weather, autumnal fever prevails. Whenever this marshy state is done away by draining, by filling with earth, by covering with water, or by excessive drought in the heat of summer, the fever ceases. The presence of both heat and moisture is shown to be necessary by the failure of the fever to appear in cool countries until hot weather, and by its disappearance in cold weather; as well as by its failure to appear in hot countries until the rains set in, and its disappearance as soon as the country becomes dry after the rains or inundations cease.

It cannot be admitted as an objection to this known truth, that cases of fever occur at a distance from marshes or the borders of streams. Whatever these may be attributed to, it remains absolutely certain that whenever heat and moisture co-operate on vegetable matter, there fevers arise.

The circumstances accompanying the appearance of these diseases, show further in the most striking manner, that they are the effect of a cause produced by the co-operation of heat and moisture on vegetable matter, and driven by the wind on those who suffer. The single instance of the occurrence *at Gallipolis*,* shows this in the clearest manner: but there are thousands of instances to prove it. This position is just as certain as that first stated. The occurrence of cases of fever in such situations that it is asserted this cause cannot be present, is no proof that the latter does not produce those cases which occur where it is present.

With regard to the cause of those cases which occur in elevated situations, it is to be borne in mind that those who dwell in such places, are not subject to fevers unless there are sources of miasmata in the neighbourhood. The hills of the island of Madeira are not subject to such fevers. They are so precipitous that no marshy surface can exist. The same may be said of the Canaries, of Montserat, of Nevis, and much the same of Bermuda and St. Christopher's. On the contrary, those hilly situations in which the disease appears, are uniformly in the neighbourhood of sources of miasmata. Dr. Ferguson, in an essay in which he endeavours to establish this very point, that miasmata are not the cause of autumnal fevers, has brought forward a number of instances in which they appear on elevated situations: but there is not one stated in which a source of miasmata does not exist in the neighbourhood, and in such a direction that the prevalent winds (the trade-winds) carry them towards the hill. In one instance of two hills, the one nearest the marsh was the seat of disease, and another five hundred yards further off, and sheltered by the former, was entirely exempt.†

It is evident therefore that miasmata produce the fevers near marshes and the borders of streams: and when we see fevers precisely of the same nature, occurring at the same time at some distance from these sources of miasmata, it is not reasonable to say they are not produced by them; particularly when this agent is of such a nature that it must be carried forward by the wind, and ob-

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*Trans. Jour. vol. 1. p. 345. †Ibid. vol. 1. p. 354.

remote causes. Even in the course of the autumnal season, fever is often induced in persons under the influence of miasmata, by exposure to cold, sometimes during sleep in cool nights, or by neglecting to change wet cloths. It is evident therefore, that when a population is under the influence of miasmata, the co-operation of cold will produce a continuance of the epidemic through the winter months.

Cold, in addition to its influence on the action of the heart, whereby it produces fever,* has a local operation upon the part to which it is immediately applied. It is known that when cold is applied for some time to any external part of the body, it produces redness and swelling, which often amount to severe inflammation. In like manner when applied to the fauces and to the lungs, it often produces inflammation in these parts. Fevers accompanied by these local affections, are distinguished by appropriate names. Fever with such a local affection of the lungs or pleura is called pneumonia or pleurisy.

When therefore cold produces fever with such local affections, or pleurisies, in persons who are under the influence of mi-

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servation alone can determine the distance to which it is capable of being carried in force sufficient to produce effect. At least it lies on the objectors to show that this cause, which produces the fever nearer its source, does not produce it when it appears further off in the direction in which we know it is passing.

It is frequently objected that the chemists have not yet been able to discover any difference between the atmosphere of marshy ground and that of more elevated and healthy situations. But we know there is a difference; we experience its fatal effects; it has even been a matter of common observation for hundreds of years, that those who are exposed to a current of air from marshy ground are sure to suffer, and means have been resorted to to avoid it with great advantage. Shall we then deny the evidence of our senses because chemistry is not yet perfect? shall we say a gaseous fluid does not exist when we have evidence of its effects before our eyes, because chemists have not yet been able to discover the nature of that fluid? because they have not yet been able to point out a chemical test of its presence? Were not those who saw dogs expire in the celebrated Italian grotto, certain of the presence of a deleterious agent in the air of that place before the chemists had discovered a test of the presence of carbonic acid gas? Would they have credited any one who should have denied its existence because they had not yet been able to point out such a test? How were they certain of its presence? They knew it only by its deleterious effects. So we, though we have not yet been able to discover the relations of the gaseous fluid called miasmata to other gaseous fluids, on which alone rests the knowledge of a chemical test of its presence, are nevertheless certain of its existence by its effects; viz. by observing that in whatever direction it is carried by the wind, it produces certain effects which disappear when it ceases to be carried there.

*Trans. Journ. Vol. 1. p. 79, &c.

asmata, bilious symptoms, the effects of miasmata, likewise appear, and the disease is called bilious pleurisy. Bilious pleurisy therefore, as well as the cases of fever which occur in winter, is the effect of the combined operation of miasmata and cold.

The effect of the cold of winter therefore, upon a population under the influence of miasmata, is to produce a continuation of cases of the autumnal epidemic through the winter months, together with cases of bilious pleurisy in those who are so exposed to cold as to have a local inflammation produced in the lungs.

It would follow from this exposition of the manner in which winter epidemics are produced, that they should appear in places in which miasmata abound, that they should prevail most in winters following autumnal seasons in which miasmata abound, and that the bilious symptoms in the winter epidemic should correspond in violence with those of the preceding autumnal epidemic. The truth of these inferences and of the general doctrine of the dependance of these winter epidemics, as well as those of the summer, on miasmata, is fully supported by the following statements.

"Bilious intermitting fevers are very prevalent during the autumn in the level countries near the sea coast of North Carolina. They also prevail near the rivers for some distance above the low lands." "Those intermitting fevers disappear as the cold weather sets in, but they are frequently succeeded by fevers of a different type, that are more fatal. Those fevers of the colder season are commonly attended by symptoms of partial inflammation, whence they are denominated pleurisies of the *eye* or of the *head*; at other times they affect the *side*. In those several forms they are *equally* dangerous." "It commonly attacks people who have been afflicted by intermitting fevers during the summer and autumn. It appears *chiefly*, perhaps *only*, in *those places* where people are subject to *intermitting fevers*, in low sunken grounds, and along the banks of rivers. In the beginning of winter, in the year 1792, that fever was very fatal in Martin county, near the river Roanoke; the river had lately been very low, and much of the muddy bottom and other

grounds usually covered by water, had been exposed to the sun. The pain was then in the head. In the year 1794, ten or twelve men, the heads of families, adjoining one another, died of that complaint in December, on the river Neus. They had lived near the beginning of the high grounds on the north-east side of the river. There had been a dry season, and the winds were generally from the south-west. The other inhabitants of the adjacent country, except on that narrow strip by the river, enjoyed good health. In the year 1792, to the best of my recollection, in the beginning of winter, this pleurisy in the head, as it was called, was endemic near Matamusket, in a settlement where the land is rich but very low, and much of it covered with water."*

Greenville is a small town on the south side of Tar river, built on a pleasant spot of considerable elevation, and nearly insulated by the river and two branches on the east and west sides of the town. The land on the north side of the river is low, broken by ponds, and subject to be overflowed during a fresh, which occurs five or six times a year, to such an extent as to cover the low land half a mile from the banks. The miry state of the branches, in many places, renders them dangerous to cattle. South of the town, and nearly a mile distant, is a mill-pond, the dam of which was broken during the summer, by which means a considerable extent of its bottom, &c. was exposed to a hot sun for nearly two months. The land between the town and this pond, is mostly under cultivation. July, August, September and October were distinguished, as usual, by the prevalence of bilious fevers: however, the fevers of this year were more particularly marked.

In February, March and April a fever proved very mortal in town and country. Some physicians called it bilious peripneumony. The attack was made by chill or ague: before this was entirely worn off, a pain of the head, breast, side, or back, seized the patient, and frequently several of these symptoms at once, increasing in violence as the fever came on, and during its pro-

*Medical Repository, Vol. 2, p. 156, by H. Williamson, M. D.

gress. The pain in the side was accompanied by a cough and expectoration of bloody matter.*

In the 7th volume of the Eclectic Repertory, we have an account by Dr. Davis, of Columbia, in South Carolina, of a winter epidemic which commenced in that town in November, 1815, immediately after the common bilious fever. It prevailed in other parts of the state also, and "the most swampy situations, margins of rivers, and places most subject to the endemial autumnal bilious fevers, suffered most severely from the epidemic."

In the same paper, Dr. Trent, of Richmond, in Virginia, in a letter to Dr. Davis, gives an account of an epidemic in the winter of 1815 in that city. "A highly bilious character sometimes attended it. The patient not only throwing off a great deal of vitiated bile, but becoming very yellow. The liver was sometimes the part on which the disease spent its force. A very frequent form of the disease was that of bilious pleurisy."

The winter of 1814 was very severe in Fauquier and the neighbouring counties of Virginia. The snow was unusually deep. An epidemic prevailed in the winter. In reply to a request made to a friend, Dr. Withers of Warrenton, for information on the subject, he wrote, "In Fauquier the epidemic was most prevalent and fatal in the *marsh*, about Woodside's; the face of the country is low and very wet. There were some cases on Tinpot (run). They generally complained of pain about the thorax; the blood when drawn was sizy; stools dark green; expectoration saffron coloured. There were cases without pain in the thorax; there was pain occasionally in the head and limbs; some complained of the toes only. There were not more than two or three cases in my practice, above the road leading to Fayettesville." The country above that road is high and hilly. The very same parts of the country were most affected in the autumnal epidemic of 1821. The same disease was excessively severe along the Potomac and Rappahannoc rivers, a country peculiarly liable to autumnal diseases.

In Philadelphia, in the winter following the great epidemic

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*Medical Repository, Vol. 5, p. 137, by Dr. G. Pillson.

of 1793, it was observed that the symptoms of yellow fever appeared in combination with those of pneumonia.

Dr Rush, speaking of the diseases of that winter, says, "But the diseases of the winter had a peculiarity still more extraordinary; and that was, many of them had several of the symptoms of the yellow fever, particularly a puking of bile, dark coloured stools, and a yellow eye." He further mentions several cases of pneumonia, in which appeared symptoms of yellow fever; as yellowness of the eyes, dilatation of the pupil, and redness of the eyes in the degree common in yellow fever.

Dr. Griffitts attended a patient in pneumonia who had universal yellowness of the skin.

In the year 1794 there were many cases of yellow fever. "The cold weather in October checked the fever, but did not banish it from the city. It appeared in November, and in all the succeeding winter and spring months." The winter was moderate. There was an uncommon mortality in the months of January, February and March, 1795.

In 1795 there were some cases of yellow fever, and the different forms of autumnal fever were of a pretty high grade. "The winter was uncommonly moderate. There fell a good deal of rain, but little snow." "Catarrhs were frequent." Several cases of bilious malignant fever appeared in March and April.

In 1796, August. September and October were uncommonly healthy. The winter was in general healthy. During the spring, though cold and wet, no diseases of any consequence occurred.*

In the autumn of 1797 the yellow fever prevailed in Philadelphia, and "was succeeded by scarlatina, catarrhs, and bilious pleurisies in the months of November and December of the

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*Vol. 3, p. 244. Vol. 4. p. 3. It is proper to observe, that in the edition of 1818 of Rush's Works, there is an error in inserting 1796 for 1795, in the passage, "The winter of 1796 was uncommonly moderate," Vol. 3. p. 243, as will appear on comparing this passage with one in the next page, viz. "The weather in December was extremely cold," &c. There is another in inserting 1797 for 1796, at the commencement of the account of the fever of 1797, Vol. 4. p. 3, as will appear on comparing that passage with the commencement of the account of the fever of 1798.

same year." The diseases of February and March were catarrhs and bilious pleurisies.

In 1798 a most violent yellow fever raged in Philadelphia. The diseases of November and December were highly inflammatory. A catarrh was nearly universal. The weather in December was extremely cold. About the middle of January the weather moderated, but "the weather was very cold, and bilious pleurisies were common during the latter part of February." It was still cold in the first half of April, and diseases, though fewer than in winter, were still bilious and inflammatory.

The yellow fever again prevailed in 1799. There is no mention of the health of the city in November and December; but in January the cold was not so great as common. Catarrhs, cynanche trachealis, and bilious pleurisies were prevalent in every part of the city. A few cases of yellow fever occurred likewise during this month. March was unusually healthy, and the weather warm in April, and the city as healthy as in March.

In the autumn of 1800 in Philadelphia there were *in* September twenty-one cases of yellow fever in Spruce-street, between Front and Second streets, all in the neighbourhood of putrid exhalations; but the city in general was so healthy, while other cities suffered, that Rush endeavours to account for it.

The months of November and December were uncommonly healthy. "The month of January was intensely cold. In February it became more moderate. The diseases during these two months, were catarrhs and a few pleurisies. In March and April there fell an unusual quantity of rain." A few mild cases of scarlatina anginosa appeared in these months.

In autumn 1801 the city was healthy. No winter epidemic but the measles.

In 1802 there was a considerable number of cases of yellow fever. No mention of the diseases of November and December, but the weather in January was uniformly cold, and in February there was a thaw; and the diseases of both these months were catarrhs and bilious pleurisies. The latter appeared in a tertian type.

In the autumn of 1803 the city was sickly. In January following the weather was clear and cold, with deep snows and rain, and was healthy. In February there was a deep snow, followed by several very cold days; there was also a fall of snow in March, followed by an uncommon degree of cold. Catarrhs and bilious pleurisies were very common during both these months. In the beginning of April the weather was cold and rainy. Bilious pleurisies were still the principal diseases which prevailed in the city.

In 1804 there was less sickness than usual in the forepart of the autumn, but in October intermittents were very common between Eighth-street and the Schuylkill. The winter was uncommonly cold and tempestuous; and during January, February and March, there was a number of bilious catarrhs and pleurisies.

Dr Rush has given no account of the winter diseases after this year, and very few notices of the autumnal. He says, however, that "Dr. Huxham and several other physicians describe bilious fevers in open winters, and particularly after a sudden thaw has succeeded a great frost."* This is precisely what I have uniformly observed. Bilious pleurisies are most frequent in the beginning of winter, when there are cold rains and the ground is wet and cold, and towards the end of winter, when there is a general thaw, very often brought on by rains; while during the uniform cold weather of mid-winter, when the earth is dry, and it snows instead of raining, it is much more healthy. They occur also in very cold weather.

It is evident from the preceding statements, that winter epidemics prevail in situations in which miasmata abound in the autumnal season; that they occur in winters following those seasons particularly favourable to the production of miasmata, and that they do not occur in winters following healthy autumns; that the symptoms manifestly indicate that they are the joint effect of miasmata and of cold; and that those symptoms of the winter epidemics which originate in miasmata, correspond in grade

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*Rush's Works, vol. 4, p. 103, from Huxham on air and epidemic dis.v. 1, p. 19.

with those of the previous autumnal epidemic. It appears also that many of the cases have no other symptoms than those common in autumnal epidemics, the operation of the cold being sufficient to produce a fever, as frequently happens in the autumnal season, but not to produce its peculiar local effects on the lungs.

There are, therefore, in winter epidemics some cases in which the symptoms of catarrh or pneumonia are the most prominent; and some in which they are not to be seen, the case being without hesitation called a bilious fever or yellow fever. Wherefore it is evident that winter epidemics are the effect of the joint operation of miasmata and cold.

These winter epidemics have been mentioned by several authors, and yet have been very little adverted to by physicians. They are nevertheless regular in their appearance, insomuch that it is not difficult to predict with as much certainty a winter as a summer epidemic. If, for instance, we have much rain in summer, and the weather be warm, autumnal fevers are sure to appear in considerable number. So, if after an autumn abounding in miasmata the winter be very cold, as in 1814, *or wet*, a winter epidemic may confidently be expected.

Sydenham gives an account of one of these in the winter of 1675. In the summer and fall of that year, numbers were destroyed by an epidemic fever and dysentery;* and the winter epidemic commenced with the first cold moist weather. "In 1675 the season having continued occasionally warm, like summer, till towards the end of *October*, and being suddenly succeeded by cold and moist weather, a cough became more frequent than I remember to have known it at any other time; for it scarce suffered any one to escape, of whatever age or constitution he were, and seized whole families at once. Nor was it remarkable only for the numbers it attacked, (for every winter abundance of persons are afflicted with a cough,) but also on account of the danger which attended it. For as the constitution, both now and during the preceding autumn, eminently tended to produce the epidemic fever above described, and as there was now no

*Sydenhams's Works, Sec. 5, ch. 1.

other epidemic existing, which by its opposition might, in some measure, lessen its violence, the cough made way for, and readily changed into the fever. In the mean while, as the cough assisted the constitution in producing the fever, so the fever on this account attacked the lungs and pleura, just as it had affected the head, even the week preceding this cough; which sudden alteration of the symptoms occasioned some, for want of sufficient attention, to esteem this fever an essential pleurisy or peripneumony, though it remained the same as it had been during this constitution.

"For it began now, as it always did, with a pain in the head, back, and some of the limbs; which were the symptoms of every fever of this constitution, except only that the febrile matter, when it was copiously deposited in the lungs and pleura, through the violence of the cough, occasioned such symptoms as belong to those parts. But nevertheless, as far as I could observe, the fever was the very same with that which prevailed to the day when this cough first appeared; and this likewise the remedies to which it readily yielded plainly showed."*

Cleghorn, in his valuable work on the diseases of Minorca, which island is the seat of violent autumnal epidemics, gives a particular account of very fatal winter fevers appearing about November, and almost depopulating some corners of the island.

They begin "commonly like an ague fit, with shivering and shaking, flying pains all over the body, bilious vomitings and purgings," &c. "the most part of the sick being seized with stitches in their sides, striking upwards to the clavicle, and shoulder blade,"† &c. Beside some abatement of the fever common every morning, on the third day or beginning of the fourth, there was frequently a great remission, sometimes a total cessation of every violent symptom, so that the sick were thought to be out of danger; but on the fourth or fifth, a delirium, &c. carried off the patient in a day or two.‡

Though Cleghorn states that the most part of the sick had

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*Sydenhams's Works, Sec. 5, ch. 5.

†Cleghorn's Diseases of Minorca, p. 242. ‡Ibid. p. 246.

stitches in the sides, &c. it is plain from what he says in the beginning of the chapter, that many of the sick had no symptoms of the kind. He says, "The anniversary epidemical fevers of Minorca may be divided into two classes, which at present, for distinction sake, we shall call the summer and winter fevers. The former break out in June or July, and cease about *January*, or somewhat sooner. The latter seldom appear before November,"* &c. It is plain from this statement, that of the cases actually occurring in the winter, some resemble so nearly the summer fevers as not to be distinguished from them, and he calls them summer fevers; while others have the additional symptoms of pain about the chest, &c. with expectoration, and even of these, some, on dissection are found without any affection of the lungs or pleura.† It is this latter class that he describes as the winter fever.

These extracts show that in Europe, as well as in America, winter epidemics occur in such situations, and at such seasons, as to make it evident that they are the joint effect of miasmata and cold, and the continuance of the autumnal epidemics; or, as Sydenham says, *the very same fever which prevailed to the day when the cough first appeared.*

It is obvious from the preceding statement that in winter epidemics, there is no essential difference between those cases which are and those which are not accompanied by inflammation in the thoracic cavity. In all the cases bilious symptoms appear, and in those in which pneumonic inflammation occurs, it is only an additional symptom, and the bilious symptoms correspond in grade with those of the preceding epidemic; witness the observation of Rush, stated above, that yellowness of the eyes and skin, and redness of the eyes in the degree common in yellow fever, occurred in cases of pneumonia in the winter following an autumnal season in which yellow fever prevailed.

The bilious symptoms are of every grade which miasmata produce in autumnal seasons. Nausea, vomiting, diarrhœa, constipation, furred tongue, green and black discharges from the sto-

*Cleghorn's Diseases of Minorca, p. 238. †Ibid. p. 250.

mach and bowels, yellowness of the skin and eyes, violent headach and backache, the tertian form, the depressed state observed in autumnal epidemics, subsultus tendinum, &c. are all to be seen in winter epidemics, with and without pneumonic inflammation.

In addition to these, some of the sick have severe pain through the thorax, difficulty of breathing sometimes extreme, and cough sometimes attended by expectoration and sometimes not. These symptoms have caused this disease to be called a pleurisy; and when there is no pain in any part of the thorax, but a severe one in the head, as in every other respect the latter cases resemble the former, the people of some parts of the country have called the latter pleurisy in the head.

The pain in the side and cough are not however always the effect of inflammation in the thorax. Both these symptoms frequently accompany a state of congestion in the liver and parts connected with it,* when there is no inflammation in the thorax. Cleghorn mentions a case in which he believed the patient to have died of pleurisy. He expectorated freely from the sixth to the twelfth day of his illness. On examination however after death his lungs and pleura were found to be sound.† Cough and pain in the side are frequently observed to accompany a state of congestion in the liver and parts connected with it, in chronic cases when there is no suspicion of inflammation in the thorax. In these acute cases the symptoms are precisely the same, except that they are more severe and sometimes accompanied by strong pulse.

The remedies required in those cases of the winter epidemic in which the symptoms are the same with those of the autumnal fever, are the same precisely with those proper in the treatment of the latter. There is not a single particular in which a difference can be stated: it is needless therefore to do more than refer to the essay on this subject in a former number of this journal.

With regard to those cases in which there are catarrhal or

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*Trans. Jour. Vol. 1. p. 82. †Cleghorn's Obs. on the Dis. of Minorca. p. 246.

pneumonic symptoms, it is necessary in addition to the treatment called for by the bilious symptoms, to make use of remedies suited to remove the inflammation of the lungs. These are chiefly bleeding, and blistering.

The excessive pain in the side or breast, sometimes occurring in this disease, together with the cough and difficulty of breathing, seem to call for bleeding freely. Notwithstanding however the pressing necessity on account of these symptoms, the pulse is in many cases so low as absolutely to forbid the loss of blood; and many instances have occurred in which the physician, induced by the extremity of the sufferings of the patient, has been tempted to open a vein with consequences so manifestly injurious as to cause the remedy to be reprobated by many people. The propriety of bleeding however is to be determined by the pulse in every case; and there are cases in which all other remedies will fail to save the life of the patient without this; of which the following statement will evince the truth.

A man, who lived in a house noted for the number of its inhabitants who had been affected by autumnal fevers, was attacked in very cold weather in the month of February succeeding the very sickly autumnal season of 1823, with bilious pleurisy. He had a most violent pain in the side, excessive and almost incessant cough, and his pulse was strong, hard and tense. He was directed to be bled every day until the pulse should become soft and moderate, and to take a mercurial cathartic every day. This he did for four days, when fearing to proceed farther on such general directions, he desired me to visit him.

On the fifth day he still had a hard pulse, with pain in the side and severe cough. His passages were nearly black. He was bled immediately, and the same cathartics continued. This was done daily for three days more, when he was directed as before, to lose blood every day until his pulse should be reduced, and to continue the cathartics.

On the twelfth day I was again called. He had been bled every day except one. In the forepart of this (the twelfth) day, he had lost half a pint of blood. His pulse was still hard and tense, his cough excessive and almost incessant. I took twenty-

four ounces of blood, and gave him the same general directions with regard to bleeding, and likewise cathartics, his discharges being still very dark-coloured.

He was bled three times more in the next three days, and continued the cathartics until the thirtieth day. On the eighteenth day from the last bleeding, being in the neighbourhood I called to see him, and found him perfectly well, having been walking about for several days. The only remedies used in this case, besides those mentioned, were a blistering plaister to the side on the twelfth day, an anodyne sudorific on one occasion, an emetic of ipecacuana on another, and two ounces of syrup of squills. The effect of these remedies was so inconsiderable, that no one of them was repeated; and the whole treatment consisted in bleeding and purging daily. This man enjoyed a state of health decidedly better after this attack, than he had experienced for some time before.

Blistering also affords decided advantage when the pulse is weak and will not admit of bleeding. In such a state of things a blistering plaister and a cathartic which discharged from the bowels a quantity of green matter, I have seen produce the most surprising relief.

Blistering however will not afford more than temporary relief, and often not that if the pulse be strong, as was evident in the case stated above. If therefore the pulse require it, the patient should be bled, and the blistering deferred until, by repeated bleeding if necessary, the action of the heart is reduced; and then if the pain continue, blistering will produce marked effect.

In those cases however, above referred to, in which the pain and cough are not the effect of inflammation in the thorax, blistering will be of little service. Produced by congestion of the liver and parts connected with it, they are to be removed by lessening or removing that congestion; viz. by evacuation from the liver. In this as in all other cases, congestion is most effectually relieved by evacuations from the vessels immediately concerned. In this case blistering cannot reach the part, but evacuations from the biliary ducts produce the most decided benefit:

and as in all cases of this winter epidemic there is congestion of the liver &c., as well in those cases in which there is inflammation in the thorax, as in those in which there is none, cathartics which evacuate from the liver are of service. In the former case they are indispensible aids, in the latter the chief dependance. A friend of mine, Dr. John C. Green of Loudoun county Virginia, was remarkably successful in treating the fatal winter epidemic of 1814–15. His practice was to give the patient jalap with a small quantity of tartarized antimony, so as to vomit once or twice and afterwards purge. The discharges were green, or dark-coloured, and by continued evacuations of this kind he informed me he saved all but two of thirty-one patients.

The practice in the winter epidemics may therefore be summed up in a few words. The fever is to be treated as an autumnal fever when there is no local affection or inflammation of the lungs: and when there is, in addition to the remedies required in the former case, the patient must be treated as for pleurisy. He must be bled if the pulse will admit of it, and have a large blistering plaister applied as near as possible to the seat of pain in the thorax, as soon as the pulse is reduced if the pain continue; or if the pulse do not admit of bleeding, he should be blistered immediately.

ART. V.—*Case of Fracture and Depression of the Skull, with a Lacerated Wound of the Dura Mater, and loss of a portion of the brain, terminating successfully.* Communicated by STEPHENS R. BEATTY, M. D. of Clear Spring, Washington County, Maryland.

On the 14th of August 1827 I was requested by my friend Dr. James J. Beatty of this place, to visit with him a case of injury of the head. On reaching the patient, a negro slave belonging to Mr. Henry Fiery living a few miles from town, we were in-

formed by his master that in a quarrel an hour or two before with a hireling on the farm, Harry had received a blow on the head with the but-end of a stone-auger two inches long, thrown with great force; that he fell immediately upon receiving the blow, and laid in a senseless state for some time.

Upon turning to the patient we discovered a lacerated wound of the integuments on one side of the head over the coronal suture, and a considerable depression of the bone could be felt. He was just recovering from the effects of concussion, had vomited several times, and had come perfectly to his senses, but his pulse was still very feeble.

We at once determined on removing the depressed bone, and proceeded immediately to the operation. The integuments being raised from the pericranium in three flaps, the depression was found to be directly on the coronal suture, being composed of part of the frontal and part of one of the parietal bones. The largest piece of bone laid in the centre, surrounded by a number of spicula. By depressing one side of the central piece gently with a finger, the other side was elevated enough to seize it with the common dissecting forceps, (which was the only instrument excepting the scalpel used in the operation,) and was removed without difficulty. A lacerated wound was now discovered in the dura mater large enough to admit the introduction of two fingers, and through it escaped several detached pieces of brain, and a small quantity of blood. The spicula of bone were then removed in succession. Several peices had been forced through the dura mater into the substance of the brain, where they could be felt at the depth of an inch or more with the finger, these were removed by the same instrument, the finger being used as a guide to it. Considerable force was exerted in removing a scale of the inner table, which it was feared would irritate the dura mater if left. The number of peices removed amounted to sixteen, and the size of the orifice in the skull was about that of a half dollar. The inner table of the central piece had on it the impression of a branch of the middle artery of the dura mater; this had been wounded and bled very freely during

the operation, but ceased spontaneously after the parts were sponged and left undisturbed.

The integuments were brought loosely together by a stitch passed through the corners of the flaps, and those portions of the wound most distant from the centre brought together by adhesive plaister, while the centre was left somewhat open. After this dressing, and before a compress was applied the patient vomited: the fulness thus produced in the head forced up the integuments to the size of half a hen's egg, and more of the brain passed through the wound; pressure being immediately made by the palm of the hand, the parts were secured until the vomiting ceased, when a compress and bandage were applied. The quantity of brain lost amounted to one or two ounces. After the operation no pain or uneasiness was felt. The Doctor visited him again in the evening, when reaction having come on, he bled him from the arm.

15th. We visited him together this morning, and having a strong and full pulse, with considerable pain in the head, and general increase of temperature, but particularly in the head, he was bled from the temporal artery ad deliquium animi, which relieved his head completely. After this bleeding he never complained of any considerable pain in the head. The whole head was shaved, and pounded ice and water ordered to be applied to it in a bladder, whenever its temperature became too great. The head of the bed was raised, that his head might have all the benefit to be derived from an elevated position. Ordered an infusion of senna and salts which operated freely. He was visited in the evening and again bled from the arm.

16th. Venesection.—Took in succession castor oil ℥ij—Croton oil gtt. iij—and infusion of senna before they had any effect, but they at last operated powerfully.

17th. The wound was to-day dressed. The outer parts have healed by the first intention, the central part is suppurating. The stitch was removed. Some brain still continues to be discharged. From this time he took no medicine, and on the 30th, sixteen days after the injury, he left his bed cured and went to

making cider. The whole amount of blood lost was eight pounds.

September, 1828. I have seen and examined this man frequently since the reception of the injury; his corporeal strength and intellectual faculties have been ever since and are now as strong as they ever were, and he has ever since his cure performed the most laborious work on the farm as well as formerly, suffering no inconvenience in the head. The orifice has filled up considerably with ossific matter, the membrane which covers the remainder being very firm, but the pulsations of the brain can still be perceived under it.

Although in proceeding to this operation, *while the patient was perfectly in his senses, and before any symptoms of compression had evinced themselves*, we acted contrary to the principles laid down by Desault, Abernethy, Cooper, and other standard authors on this subject, I am confident that the practice is correct. While it is more than probable that the use of instruments in injuries of the head, is too generally condemned by these gentlemen even for hospital practice, I am well aware that the principles which are applicable to the treatment of patients in the crowded and ill ventilated hospitals of large cities, are inapplicable here, particularly in country situations, where the inhabitants are more robust and blessed with strong constitutions in comparison with those of large cities; and I am daily more and more convinced of the importance of practitioners both of medicine and surgery in the United States constantly bearing this fact in mind. We must not therefore be strictly governed by the principles adapted to hospital practice. Patients in them with severe local injuries, such as compound fractures and dislocations, are not depleted, but on the contrary in a short time after the injury, are treated by tonics and stimulants to support their strength; while here we have to push blood-letting, tartar emetic, calomel and low diet to a great length to keep down inflammation in such cases. Erysipelas in them is treated by tonics, stimulants, and nourishing diet, while the very opposite practice is necessary here.

I am gratified to find the operation in the above case sanctioned by the following principle, contained in an invaluable paper

on injuries of the head, by Professor Dudley, which has governed his practice in such cases.† "A fracture and depression of the skull accompanied by laceration of the integuments to such an extent, that suppuration must supervene as necessary to the process of restoration, calls for the operation of the trephine as a measure of prudence and caution, although no evidences are exhibited of an injury or loss of any of the faculties either of body or mind. The liability, under such circumstances, to symptoms of compression, from the presence of pus confined beneath and about the depressed bone, while the depressed bone becomes a cause of continued morbid excitement, renders the operation advisable in the earliest stages of such an injury."

ART. VI. *Case of Menorrhagia, successfully treated with Cathartics.* By DR. ALEXANDER S. BROWN, of Stephensburg, Frederick county, Virginia.

The subject of the following case is a native of this town. She is about thirty or thirty-five years of age. In the earlier part of her life she had enjoyed good health; but since the spring of the year 1823 it had been declining. Some months previous to that time she had left the residence of her father and took upon herself the management of a family. In April of the same year a material change was discoverable in her health. Instead of a ruddy complexion, she exhibited a sickly palidness; her bowels became costive with indigestion and pains in the stomach, sides, and back; sometimes a week elapsed without an evacuation from the bowels.

In this situation in the month of June, she gave birth to a child. The delivery was attended with great pain and difficulty, and for several months after she was confined to her bed with raging fevers and pains in different parts of the system, particularly in the uterus, right side and head.

† Transylvania Jour. No. I. p. 11.

From that time, and until the last of March 1828, all those symptoms increased in violence; the catamenial discharge becoming so troublesome that it was with difficulty she could move about.

On the first of March 1828 she had an attack of bilious fever. When the physician saw her (the same gentleman who had attended through her previous sickness), supposing the seat of the disease to be the liver, his remedies were directed to that part. They consisted, as well as I could understand, of broken doses of calomel night and morning, with an occasional dose of Epsom salts. While pursuing this course of practice, however, she became worse every day, no beneficial effect being produced by the prescription.

On the tenth day of the month (March,) I was called in; at which time her situation was alarming indeed. She was prostrate on the bed; not able to move from one part of it to another without assistance: her frame, the most emaciated I ever beheld, was tortured by excruciating pains in the uterus, stomach, right side, head and back, with an alarming menorrhagia. The discharge from the uterus and vagina was so excessive as to oblige the attendants to make use of cloths frequently replaced in order to keep the bed clean. When I approached the bedside her case appeared almost hopeless. Her extremities were cool; her skin clammy; pulse small, soft and rather intermitting. But being urgently solicited by the family to make some effort to save the patient, and being myself greatly desirous of doing so, I ordered French brandy and water to be given to her until it completely roused the circulation. In a short time it had its effect, the pulse became full and soft, the skin warm, and a pleasant moisture pervaded the whole surface; with a manifest diminution of the menorrhagia.

This however was not of long duration: as soon as the effect of the brandy disappeared, all the symptoms returned with equal if not greater violence. I then determined upon the following prescription as the best I could use. It is taken from a note book kept during the patient's indisposition.

℞. Pulv. Rhei ℈ij. Aloes Socot. ℈ij,
Sulph. Ferri grs. 15. M. F. pill. 15.

Three of these pills were to be taken at bed time, and three in the morning. My object was to stimulate moderately and produce three or four consistent discharges from the bowels through the day.

11th March. I visited her in the morning shortly after she had taken the second dose of pills. The nurse informed me that the previous dose had operated three times through the night; and that shortly after the operation commenced, she thought she could discern an alteration in the discharge of blood: the discharges from the bowels were thick and black; pulse fuller and softer; I could see no other material alteration. Directed a continuance of the pills.

13th. Found the pills operating moderately; discharges consistent and black; pulse about sixty in a minute, full and soft; skin improved in colour; the appetite, which was quite gone before, began to return a little. Her diet consisted of soups with a small quantity of light bread. Directed a continuance of the pills at bed time only, as the bowels were more easily acted on than at first.

18th. I had unavoidably been absent five days: on my return found the nurse (who was an active, smart woman) going on as I had directed. She informed me that the operations had been kept up regularly; at this time the colour of the evacuations had changed from black to a light green, and were quite consistent: menorrhagia had entirely ceased, and her complexion had assumed a healthy appearance. She was able to rise from the bed and walk across the room without assistance: her appetite was good; so much so as to enable her to eat the ordinary food of the table without inconvenience.

On the 20th of march such a material alteration had taken place in her health, I deemed it unnecessary to repeat my visits. She was raised as it were from the margin of the grave to a comfortable state of health in the course of ten or fifteen days.

She continued to take the pills for some time after this, but it would be extending this paper to an unnecessary length to

follow my note book through the whole course: it is sufficient for me to say that she has enjoyed perfect health for the last too or three months with the exception of occasional attacks of the head-ache.

ART. VII.—*Case of Mania cured by Counter-irritation.* Communicated by Dr. JOHN DAVIS, of Jackson, Tennessee.

John Hall aged about 30 years, of firm constitution, and phlegmatic temperament, by trade a mechanic, was admitted into the New Orleans charity hospital about the beginning of the year 1825. He was confined to his cell at night and permitted to walk about the yard of the institution during the day. No particular treatment was followed in his case further than regimen, &c. He was a complete maniac, quite melancholic, distant and gloomy in his habits. About the first of March 1826, one of his legs was discovered to be severely inflamed and swelled from the toes to above the knee. The colour of it was a deep purple, and it looked truly threatening. John said it was extremely painful, and it engrossed his entire attention. At this time he began to manifest a rapid improvement of his mental powers; which were noticed to improve every day; and in a week more he was thought pretty well restored to his right mind, and was ordered by the attending physician to be removed from his cell to the surgical ward. The patients of that ward were disposed to interrogate him on various subjects; he answered their questions as a man enjoying a sound mind. It was the opinion of all the officers of the hospital that he was restored by the aggravated and painful swelling of his leg. I left the hospital shortly after his restoration to reason, when he still continued a surgical patient.

ART. VIII.—*Florula Lexingtoniensis, secundum florendi ætatem digesta; or a descriptive Catalogue of the Phænogamous plants indigenous to this portion of Kentucky; arranged in the order of their periods of flowering.* By CHARLES WILKINS SHORT, M. D. Professor of Materia Medica and Medical Botany in Transylvania University.

CONTINUED FROM PAGE 422. NO. III.

FASCICULUS III.

For the last of April and first of May.

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44. GENUS CORNUS. *L.*

(*Deriv.* Latin; *Cornu*, a horn; in allusion to the horny toughness of its wood. *Smith.*)

Class 4th. TETRANDRIA,—Order, MONOGYNIA.

Gen. Ch. Calyx superior 4-toothed. *Petals* 4, small, superior, broader at the base. *Drupe* inferior, containing a 2-celled nut.

Species 1st. CORNUS FLORIDA. *Dog-wood.*

Sp. Ch. Arborescent; *leaves* ovate, acuminate; *flowers* aggregated in a large 4-leaved involucrum.

Obs. In common with the red-bud, white oak and poplar, (tulip tree,) the dog-wood is confined in this county, to the thinner and more broken soils bordering on the Kentucky river and other water-courses, never being found on the first rate lands. In those situations favourable to its growth it attains considerable size, individuals being occasionally met with whose trunks measure a foot or more in diameter. The large white involucres, which are generally mistaken for its flowers, make a handsome show towards the 20th of April when fully evolved. The bark, dried and pulverized, has been long known as a useful tonic, by some even thought equal in efficacy to that of the Peruvian cinchona; and the durability, firmness and strength of its wood fit it especially for certain mechanical purposes.

This is the only species of Cornel which I have met with in this locality, although in other portions of the state, the cornus sericea and cornus paniculata frequently occur.

45. Genus. MALUS. *L.* *Apple.*

(*Deriv.* *Malus*, the Latin name for an apple-tree.)

Class 13*th.* *CALYCANDRIA*,*—*Order*, *PENTAGYNIA.*

Gen. Ch. *Calyx* superior 5-cleft. *Petals* 5. *Styles* connate at base. *Apple* spheroid, umbilicate at each end, fleshy, 5-celled, many-seeded.

Species 1*st.* Malus Coronaria. *Crab-apple.*

Sp. Ch. *Leaves* broad oval, rounded at the base, somewhat angled, serrate, smooth; *peduncles* corymbose.

Obs. The crab-apple tree, which was at one time more abundant than at present, is yet found occasionally in the more secluded woods of this county; and, where in clearing the land it has been allowed to remain, it forms a tree nearly equalling in magnitude the cultivated variety. The flowers of the wild crab are, indeed, more showy than those of the domestic apple-tree: they are white with a slight tinge of red, and are collected into corymbs; when in full bloom they produce a beautiful effect and diffuse a delicious odour to a great distance: The fruit is sometimes preserved with sugar.

Syn. Pyrus Coronaria, *Ell. Pursh*, &c.

46. Genus. CRATÆGUS. *L.* *Hawthorn.*

(*Deriv.* Greek. *Kratos*, strength: from the strength and firmness of the wood. *De Theis.*)

Class 13*th.* *CALYCANDRIA*,*—*Order*, *DI-PENTAGYNIA.*

Gen. Ch. *Calyx* 5-cleft. *Petals* 5. *Styles* 1 to 5. *Fruit* a farinaceous berry, or small apple producing from 2 to 5 bony seeds.

Species 1*st.* Cratægus coccinea. *Red-haw.*

Sp. Ch. Thorny: *leaves* on long petioles, obovate, subcordate, acutely lobed and serrated; *petioles* and pubescent *calyx* glandular: *flowers* pentagynous.

Obs. A small, well known and very common tree, flowering about the 20th of April, and producing an abundance of scarlet haws which are large and pleasantly tasted. They ripen in September.

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*I here adopt the name proposed for this class by Dr. Darlington in his Florula Cestrica, as being more descriptive of its character, (the insertion of the stamens on the calyx,) than the Linnæan name, Icosandria.

Species 2d. CRATÆGUS FLAVA. *Yellow-haw.*

Sp. Ch. Spiny: *leaves* obovate, cuneate, angled, glabrous; *petioles, stipules* and *calyx* glandular; *flowers* generally solitary; *berries* turbinated, 4-seeded.

Obs. A small tree, about the size of the red-haw and flowering at the same time, but less common, and differing from it in producing yellow fruit which are larger, and not so numerous: they are acid and also pleasantly tasted, and ripen in October.

Other species of the hawthorn no doubt exist in this locality; but the genus is an obscure one and I have not been able distinctly to define them. Great diversity obtains in the size of the leaves of different individuals; and I have met with one tree whose flowers were all pentandrous!

47. GENUS. ANNONA. *L.* *Pawpaw.*

(*Deriv.* Latin *annona*, provision; from the eatable nature of the fruit.)

Class 12*th. POLYANDRIA.—Order, POLYGYNIA.*

Gen. Ch. *Calyx* 3-leaved. *Petals* 6. *Stigmas* sessile, obtuse. *Berries* (one or more,) large, cylindrical or ovate, many-seeded.

Species 1*st.* ANNONA TRILOBA. *Pawpaw, Custard-apple.*

Sp. Ch. *Leaves* glabrous, long, cuneate-obovate; *exterior petals* four times as long as the calyx, nearly round.

Obs. This portion of Kentucky was once the paradise of pawpaws, where immense orchards of large trees were every where met with; but cultivation and the ravages of cattle have greatly lessened the number. Trees of this species are occasionally met with 25 or 30 feet high, but for the most part they do not attain half that stature; and are often loaded *with fruit* when not more than 6 or 8 feet high. The flowers, which are large and singular, of a deep black purple, appear *about the* 20th of April before the leaves are put forth, and are succeeded by fruit of an oblong shape, at first green-coloured, then assuming a yellow and purple hue; when grown they often measure 6 or 8 inches in length, and weigh nearly a pound: they consist of several large seed surrounded by a soft, yellow, pulpy matter and covered by a thin skin. This fruit, when fully ripe, and slightly touched by the frost, is highly esteemed *by the* most of persons; and although Dr. Smith, the learned president of the Linnæan Society of London, affirms that it is "relished *by* few except the negroes," yet I have known many persons of cul-

tivated taste declare it equal to any of the tropical luxuries. The bark of the pawpaw tree is so strong and fibrous that ropes are occasionally made of it; the wood is soft and worthless.

Few genera have been more confused by conflicting synonyms than this. Thus the elder Michaux calls the present individual, *Orchidocarpum Arietinum;* Pursh and Nuttall, *Porcelia triloba.* Elliott, *Asimina triloba,* &c. Without stopping to inquire into the expediency of these innovations upon established names, I will barely express my preference for that which is adopted in this catalogue, in which I am sanctioned by Linnæus, Smith and the younger Michaux, whose opportunities of examining all the species were as good as those of any other botanist.

48. Genus. QUERCUS. *L.* *Oak.*

(*Deriv.* An ancient Latin name of obscure etymology.)

Class 21*st.* *MONOECIA.—Order, POLYANDRIA.*

Gen. Ch. Masc. *Ament* naked, linear. *Calyx* slightly 5-cleft. *Corolla* none. *Stamens* 5 to 10.

Fem. *Calyx* 1-leaved, entire, scabrous. *Corolla* none. *Styles* 2 to 5. *Nut* coriaceous, surrounded at base by the persistent calyx.

Species 1*st.* Quercus alba. *White oak.*

Sp. Ch. *Leaves* oblong pinnatifid-sinuate, pale or pubescent beneath; *lobes* oblong, obtuse, mostly entire; *cup* deep, tuberculate; *acorn* ovate.

Obs. The white oak is not often met with in the rich tract of land immediately surrounding Lexington; but is found abundantly in that part of Fayette county bordering the Kentucky river; where the soil becomes thinner and the face of the country more rolling. In these situations it attains its largest size, and is readily distinguished from all other trees of the same family by its whiter bark, which is often, in the younger trees, disposed in alternate bands of a finer and coarser texture, giving to the tree a characteristic appearance. The strength, solidity and durability of its wood fit it for a vast variety of useful purposes.

Michaux, in his elaborate and elegant work on the forest trees of America, hazards the opinion that in process of time, by the gradual deterioration of the soil, the white oak will be spontaneously produced in those sections of the Union which are now too rich to grow it. This tree, in common with the other oaks

which follow, blooms about the 25th of April, but their flowers are too inconspicuous to attract attention, and their acorns ripen and fall upon the coming of the first frost.

Species 2d. QUERCUS MACROCARPA. *Over-cup White oak, Bur-oak.*

Sp. Ch. *Leaves* wooly beneath, deeply lyrato-sinuately lobed; *lobes* obtuse, repand, upper ones dilated; *cup* deep, with the upper scales bristly; *acorn* large, oval.

Obs. This noble species is every where met with in the rich forests of this neighbourhood, towering above the most of other trees and throwing out its large umbrageous branches to a considerable distance around. It is distinguished from all other American oaks by its larger leaves, which are sometimes 12 or 15 inches long by 8 broad: the acorn, which is also of unusual magnitude, is singularly invested by the shaggy scales of the cup, in the form of a fringe. The bark of the trunk and limbs is much rougher and more furrowed than the preceding species, and its wood more porous, and less durable; nevertheless it is valuable for fencing and fuel.

Species 3d. QUERCUS PALUSTRIS. *Pin oak, Swamp Spanish oak.*

Sp. Ch. *Leaves* on long petioles, deeply sinuate smooth; *lobes* divaricate, dentate, acute; *cup* flat, smooth; *acorn* sub-ovate.

Obs. Next to that just mentioned, the present species is most frequently met with in the woods around Lexington; although, from its specific name, it might not be looked for in the dry upland of this portion of the state; for Michaux affirms that it "grows constantly in moist places, and of preference about swamps enclosed in the forests;" in confirmation of which remark it may be observed that where such situations occur in this county, the tree will always be found. Like the Q. Macrocarpa, it attains to a great size, and in consequence of its wood splitting well it is often used for rails, shingles, laths &c. although it is not durable. The fine, glossy texture, and beautifully *scolloped* form of the leaves, which are more delicate than those of any other oak, give to this tree a peculiar and softer aspect than is common with the family, whose foliage for the most part is harsh and coarse.—The acorns are middle-sized, seated in shallow cups.

Species 4th. QUERCUS PRINUS ACUMINATA. *Chestnut white oak. Yellow oak.*

Sp. Ch. *Leaves* on long petioles, obtuse at the base, acuminate, coarsely toothed; teeth subequal; *cup* hemispherical, *nut* ovate.

Obs. This species is not so abundant, nor is it so large a tree as the last, though in common with it, it is found growing on the richest soils. The general appearance is that of the white oak; but they differ essentially in the form of their leaves, the size of their acorns, and still more in the qualities of their wood, the present species being every way inferior to that. The acorn is oval, black, and of a smaller size, and is said by Michaux to be also sweeter than that of any other of the American oaks. Different individuals of this species differ essentially in the size of their leaves, these being generally larger in proportion as the tree is young: a reference, however, to the acorn will always distinguish it.

Syn. Quercus Castanea. *Purih* and other American botanists.

Species 5th. QUERCUS IMBRICARIA. *Laurel oak.*

Sp. Ch. *Leaves* oblong, acute at each end, mucronate, entire, shining above, pubescent underneath; *cup* flat; *acorn* nearly spherical.

Obs. The laurel oak, though a very common tree in some portions of Kentucky, especially in that section called "the barrens," is comparatively rare in this locality; nevertheless it does occur occasionally in company with the last on the richest lands, and is always, when in foliage, a pleasing object, in consequence of the deep glossy green of its leaves, which, unlike any other oak of this country, are oval and entire, without serratures or scollops. This resemblance of the leaf to that of the mountain laurel, (Kalmia latifolia,) has given an appropriate English name to the species. It does not attain any considerable size, nor is its timber valuable.

Species 6th. QUERCUS TINCTORIA. *Black oak.*

Sp. Ch. *Leaves* deeply sinuated, the lobes terminating in sharp points, pulverulent beneath, shining above: *cup* saucer-shaped; *acorn* ovate.

Obs. The black oak derives its common name from the dark colour of its outer bark, by which it may at all seasons be distinguished from its congeners. It is one of the largest trees of the American forest, and highly valuable from the qualities of its wood in the mechanic arts, and of its bark in the processes of dyeing and tanning.—It is comparatively rare in this locality, though abundant in the surrounding country.

Syn. Quercus discolor. *Willd.*

49. GENUS. JUGLANS. *L.* *Walnut.*

(*Deriv.* Contracted from *Jovis glans;* on account of the excellence of the fruit.)

Class 21*st.* *MONOECIA.—Order, POLYANDRIA.*

Gen. Ch. MASC. *Ament* imbricate. *Calyx* a scale. *Corolla* 5 or 6-parted. *Stamens* 18 to 36.

FEM. *Calyx* superior 4-cleft. *Corolla* 4-parted. *Styles* 1 or 2. *Drupe* coriaceous or spongy. *Nut* rugose, furrowed.

Species 1*st.* JUGLANS NIGRA. *Black walnut.*

Sp. Ch. *Leaflets* numerous, oval-lanceolate, serrate, narrowed above: *fruit* globose, scabrous, punctate.

Obs. No tree of the same magnitude is more common throughout the better lands of Kentucky, than the black walnut; but it appears to be particularly obnoxious to lightning and other accidents; hence the older stocks have very generally a mutilated appearance. Next to the elm this tree is the most usual domicil of the parasitic mistletoe. The wood of the black walnut is a good deal used in house-joinery, and in the coarser sort of cabinet work. The kernels of the nuts abound in a *mild* oil, and when thoroughly dried are palatable to the most of persons; and the spongy envelope of the nut is much used as a domestic brown dye for woolen cloths. Flowers towards the 25th of April. Fruit ripens in September.

Species 2*d.* JUGLANS CATHARTICA. *White walnut. Butternut.*

Sp. Ch. *Leaflets* lanceolate, serrulate, pubescent: *petioles* villous; *fruit* oblong-ovate; *nut* deeply furrowed.

Obs. This is a smaller tree, and even more abundant than the preceding. It is called white walnut in consequence of the ashy colour of its smooth bark; from which circumstance also one of its botanical synonyms, (J. Cinerea) originates. The wood is soft and light-coloured, little used in mechanicks except for the purpose of making firkins for holding butter, lard and other oily substances, for which it is said to be peculiarly fitted. An extract made from the inner bark by boiling in water and evaporation, has long been a deservedly popular cathartic in the western country. The nut is more oily and less esteemed than that of the preceding walnut.

80. Genus. CARYA. *Nuttall.* *Hickory.*

(*Deriv.* *Karya*, the ancient Greek name of the Walnut tree.)

Class 21*st.* *MONOECIA—Order, POLYANDRIA.*

Gen. Ch. Masc. *Ament* imbricated. *Calyx* 3-parted scales. *Corolla* none. *Stamina* 4 to 6.

Fem. *Calyx* 4-cleft, superior. *Corolla* none. *Styles* none. *Stigma* partly discoid, 4-lobed. *Pericarp* 4-valved. *Nut* subquadrangular, even.

Species 1*st.* Carya sulcata. *Ell.* *Thick Shell-bark Hickory.*

Sp. Ch. *Leaflets* about 9, oblanceolate; *fruit* 4-angled; *nut* long, mucronate.

Obs. This is one of the most abundant of the genus in this neighbourhood, rising to a very considerable height, (80 or 90 feet,) with a slender body in proportion to its elevation, and destitute of limbs for more than half its length. The greatest peculiarity, however, of this and the succeeding species is the division of the exterior bark into long narrow plates attached to the tree by inconsiderable holds, and separated from it at each end, giving to the tree a characteristic appearance. The nut is large, invested by a thick covering; its shell is thick, and the kernel well tasted. The wood like that of the most of hickories, is highly prized for fuel, and is much used by mechanics on account of its toughness and elasticity. Flowers towards the last of April; fruit ripens and falls in September.

Syn. Juglans laciniosa. *Michaux.*

Species 2*d.* Carya squamosa. *Shell bark hickory, shagbark, scaly bark, &c. &c.*

Sp. Ch. *Leaflets* about 5, long-petiolate, lance-oblong; *fruit* depressed globose; *nut* small, compressed.

Obs. A large tree very similar in its growth and general appearance to the last, and like it, remarkable for the singular exfoliation of its epidermis, which has given it its common names. The present individual, however, is distinguished from the last by the number of leaflets which are almost uniformly five, and by the size of the nut, which, although enveloped in a thick rind, is much smaller than the preceding. These nuts have thin shells, are easily cracked between the teeth and are more highly esteemed than any other of the hickory nuts, except the

pecan. The wood is very similar to that of the preceding, and indeed the trees are often confounded.

Syn. Juglans squamosa. *Mx.*
Carya alba. *Ell.*

Species 3d. CARYA TOMENTOSA. *White heart hickory. Mockernut, &c.*

Sp. Ch. *Leaflets* about 9, oblanceolate; *amenta* tomentose; *nut* thick-shelled, hard.

Obs. Less common than either of the preceding in this neighbourhood, and a smaller tree with a less shaggy bark. This is the species so abundant in the barrens of Kentucky where the growth being obstructed by annual fires, whilst the root continues to extend itself, an immense and solid mass is found beneath the soil attached to a bare shrub above it. This species, moreover, is characterized by the large amount of hard, close-grained, white sap-wood which it bears, and which is especially fitted for axe helves and axle-trees. It is thought a superior fuel to all the other hickories.

Syn. Juglans tomentosa. *Mx.*
Juglans alba. *Willd. Muhl. &c.*

Species 4th. CARYA PORCINA. *Pig-Nut Hickory broom hickory.*

Sp. Ch. *Leaflets* about 7, lanceolate glabrous: *fruit* pyriform, or globose.

Obs. The Pignut is easily distinguished from the other hickories by its smoother bark, its narrower leaves, and smaller fruit; for although the nut itself is about the size of that of the C. Squamosa, or small scaly bark Hickory, yet in the pig-nut the hull is so much thinner as to make the fruit altogether much less. It is in every respect the least valuable of the family, the wood being not fitted for useful application to the arts, less valuable as fuel; and the nut unfit to eat in consequence of its bitterness and astringency. Young trees of this kind are, however, more common around Lexington than any other Hickory.

Syn. Juglans porcina. *Mx.*

51. GENUS. MORUS. *L.* *Mulberry.*

(*Deriv.* From *Morea*, the Greek name of the tree, which is of obscure derivation.)

Class 21st. MONOECIA.—Order, TETRANDRIA.

Gen. Ch. MASC. *Calyx* 4-parted. *Corolla* none. FEM. *Calyx*

4-leaved. *Corolla* none. *Styles* 2. *Calyx* becoming a berry. *Seeds* solitary.

Species 1st. MORUS RUBRA. *Common Mulberry.*

Sp. Ch. *Leaves* cordate, ovate, acuminate, frequently three-lobed, equally serrate, scabrous, pubescent underneath; *fertile aments* cylindrical.

Obs. Owing to the depredations of stock upon this valuable tree, whose bark is a favourite food with horses and sheep, it is becoming rare in this quarter where it once abounded: young trees are never met with in exposed situations, and the old ones have generally a decaying aspect. The sexes are sometimes together on the same plant and again separate, so that trees are occasionally found which never bear fruit. The wood of the mulberry is more durable when exposed to the vicissitudes of weather than any other timber of this region, except the red-cedar and black-locust; hence, in those parts of the country where those trees are not found, this is much used as posts for fencing. It blooms about the last of April, and ripens its fruit in June.

The White Mulberry, lately introduced by seeds from France, seems to thrive well in this climate, so far at least as four or five year's experience can show.

RANUNCULUS. [SEE GENUS 22.] *Crowfoot.*

Species 4th. RANUNCULUS RECURVATUS.

Sp. Ch. *Stem* erect, and with the petioles clothed with expanding hairs: *Leaves* 3-parted, villous, segments broad-oval, subincised, the lateral ones 2-lobed: *Calyx* reflected: *Petals* lanceolate; *Seeds* with a hooked point.

Obs. This species is easily distinguished from either of the former, by its more villous appearance and its larger leaves; a single stem, or but few, are protruded from each root, which are erect and succulent, and arise to the height of a foot or more, branching towards the summit. The radical leaves are borne on foot-stalks 8 or 9 inches long, those of the stem decreasing as they ascend. The flowers, which are small and of a greenish-yellow colour, appear towards the latter end of April, and are succeeded by globular heads of seed, each one having a hooked point. Rarer than the two first mentioned species. In shaded woods and meadows.

52. Genus. CHELIDONIUM. *L.* *Celandine.*

(*Deriv.* Greek *Kelidon*, a swallow; from the circumstance of its flowering about the time those birds first appear in the spring.)

Class 12*th.* *POLYANDRIA.—Order*, *MONOGYNIA.*

Gen. Ch. *Calyx* 2-leaved caducous. *Corolla* 4-petalled. *Silique* linear 2-valved, 1-celled. *Seeds* numerous.

Species 1*st.* Chelidonium majus. *Large Celandine.*

Sp. Ch. *Leaves* pinnate, lobed; *Segments* rounded; *Umbels* axillary, pedunculate; *Petals* eliptical, entire.

Obs. This handsome plant, so abundant on the borders of the Ohio river, is comparatively rare in this neighbourhood; its large showy yellow flowers, which would probably double under cultivation, are highly ornamental: in their natural state they are exceedingly fugacious. The whole plant is imbued with a yellow juice of an acrid, bitter, opiate taste. Flowers last of April in rich shaded situations.

53. Genus. PODOPHYLLUM. *L.*

(*Deriv.* Greek, *podos*; a foot and *phyllon*, a leaf. its leaf resembling the web-foot of some animals.)

Class 12*th.* *POLYANDRIA—Order*, *MONOGYNIA.*

Gen. Ch. *Calyx* 3-leaved. *Petals* 9. *Stigma* plaited, crenate. *Pericarp* a berry, 1-celled, many seeded.

Species 1*st.* Podophyllum peltatum. *May-Apple, Mandrake, Wild Lemon, &c.*

Sp. Ch. *Leaves* peltate-palmate, single, or two on a forked stem, *flowers* solitary, axillary.

Obs. No portion of the Union affords the May-apple in greater abundance than this, where it is found in profusion in all rich shaded woodlands. About the 1st of March its leaves appear above ground, it blooms generally towards the end of April and ripens its fruit in June. The latter is highly grateful to the taste of most persons; its leaves are deleterious and not eaten by any cattle; whilst its root, when properly dried and pulverized, affords an excellent cathartic, but little inferior to jalap.

54. Genus. COLLINSIA. *Nuttall.*

(*Deriv.* Named in honor of *Zaccheus Collins Esq.* of Philadelphia.

a gentleman distinguished for his acquirements in botanical knowledge, and general devotion to the natural sciences.)

Class 14*th.* *DIDYNAMIA—Order, ANGIOSPERMA.*

Gen. Ch. *Calyx* 5-cleft. *Corolla* bilabiate, orifice closed: upper lip bifid; the lower trifid, intermediate segment carinately saccate and closed over the declinate style and stamina. *Capsule* globose, partly 1-celled, and imperfectly 4-valved. *Seeds* 2 or 3, umbilicate.

Species 1*st.* COLLINSIA VERNA. *Early flowering Collinsia.*

Sp. Ch. *Leaves* ovate-oblong, sessile, obtuse, the inferior ones attenuated into long petioles.

Obs. This beautiful little plant, which is seen in profuse abundance on many parts of the Dry-ridge road to Cincinnati, is occasionally, though rarely, found in this immediate vicinity. It is characterized by its particoloured flowers, the upper-lip being white, the lower a bright sky blue: they first appear about the last day of April, and continue to bloom during the month of May.

In May 1815, I met with this plant in the neighbourhood of Pittsburgh; but being unable, during a rapid journey to examine it critically, I sent several specimens to my friend, the late lamented Dr. Edward Barton of Philadelphia; he submitted them to the Abbe Correa, who pronounced it a violet. Subsequent more attentive investigations by the accurate Nuttall, who had seen it so early as the year 1810, have proven it to belong to a widely different class.*

55. GENUS. MALVA. *L.* *Mallow.*

(*Deriv.* Probably from the Greek, *Malasso*, to soften; in allusion to the mucilaginous and demulcent properties of the tribe.)

Class 16*th.* *MONADELPHIA—Order, POLYANDRIA.*

Gen. Ch. *Calyx* double; the exterior mostly 3-leaved. *Petals* 5. *Capsules* many, 1-seeded, disposed orbicularly.

Species 1*st.* MALVA ROTUNDIFOLIA. *Round-leaved Mallow.*

Sp. Ch. *Stem* prostrate; *leaves* cordate, orbicular, obscurely 5-lobed; *peduncles* declining when in fruit.

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*Journal of the Academy of Nat. Sciences of Philadelphia. Vol 1. P. 189.

Obs. An exotic originally, now so thoroughly naturalised as to be met with every where in cultivated grounds and neglected wastes. Its first flowers, of a pale violaceous hue, are sometimes seen in ordinary seasons as early as the last of April; from which time the plant continues to extend itself by trailing on the ground, putting forth flowers and ripening seeds until November; being so hardy as to withstand considerable cold. Children sometimes eat the green fruit which they call ground cheese.

56. Genus. FRAGARIA. *L.* *Strawberry.*

(*Deriv.* Latin, *fragrans*, smelling sweetly; in reference to its fragrant fruit.)

Class 13*th*. *CALYCANDRIA.—Order, POLYGYNIA.*

Gen. Ch. *Calyx* 10-cleft, *petals* 5. *Receptacles* of the seed ovate and deciduous, becoming a berry.

Species 1*st*. Fragaria virginiana. *Wild strawberry.*

Sp. Ch. *Calyx* of the fruit spreading; *hairs* on the petioles erect, on the peduncles appressed.

Obs. The wild strawberry, which differs by minute distinctions only from the garden species, is not a common plant *in this* vicinity: it does, however, occasionally occur in old fields and road sides, flowering towards the last of April. In the western part of this state it constitutes a principal feature *in the* vegetation of the barrens; where, in situations fully exposed to the influence of the sun, its fruit becomes matured to *perfection*, is darker-coloured and sweeter than the strawberry of the gardens.

57. Genus. ARUM. *L.*

(*Deriv.* Probably from the greek *ara*, injury; in reference to the acrimonious qualities of the root.)

Class 21*st*. *MONOECIA.—Order, POLYANDRIA.*

Gen .Ch. *Spatha* cucullate. *Spadix* naked above; below feminine; in the middle staminiferous. *Calyx* and *corolla* none. *Berry* 1 or many-seeded.

Species 1*st*. Arum triphyllum. *Indian turnip.*

Sp. Ch. Stemless: *leaves* ternate: leaflets ovate, acuminate, very entire; *spadix* club-shaped; *spatha* ovate, acuminate, convolute below; flat and bent above.

Obs. The singularly formed flower, (spatha) of this plant, its colour, green striped with purple, and the beautiful cluster of scarlet berries, maturing in mid-summer, readily distinguish this from any other plant, except the next following, of this Flora. In rich moist woods it attains the height of 2 feet or upwards. The root weighing an ounce or more, is well known to every body, under the name of Indian turnip, for its acrid properties. Flowers 1st of May.

This plant is said to be sometimes dioecious; more frequently however it is monoecious, the males and females being placed on the same spadix.

Species 2d. ARUM DRACONTIUM. *Green dragon, &c.*

Sp. Ch. Stemless; *leaves* pedate ("rather dichotomous"); leaflets lanceolate, oblong, entire; *spadix* fusiform,* longer than oblong, convolute *spatha.*

Obs. This species is not so common as the preceding, and is easily recognized by its differently formed leaf which is composed of numerous leaflets circularly arranged on a forked petiole; and its spadix which is 6 or 8 inches long, taper-pointed and yellow. The whole plant is generally more luxuriant than the former; bearing a larger cluster of berries which are also scarlet; and having a larger root which is possessed of the like acrimony. Flowers at the same time and is found in similar situations.

58. GENUS. GERANIUM. *L.*

(*Deriv.* Greek *geranos*, a crane; the persistent style resembling the beak of that bird.)

Class 16th. MONADELPHIA.—Order, DECANDRIA.

Gen. Ch. *Calyx* 5-leaved. *Corolla* of 5 petals. *Stigmas* 5. *Arilli* 5-seeded, awned.

Species 1st. GERANIUM MACULATUM. *Spotted crane's-bill, Wild Geranium.*

Sp. Ch. Erect: retrorsely pubescent: *stem* dichotomous: *leaves* opposite, 3-5-parted incised, upper ones sessile: *peduncles* elongated 2-flowered: *petals* twice as long as the calyx.

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*I have chosen to substitute this term for Subulate, which is used in the description of the spadix, by all the writers. As it obtains with us, this organ has much more resemblance to a large spindle than an awl.

Obs. The pale purple flowers of this pretty plant make a handsome show during May, about the first week of which month they begin to appear. The radical leaves are supported on long foot-stalks, the cauline are sessile, all pubescent, and become spotted with yellow, brown and red, as the plant declines. The root is knotty and tuberous, possessed of considerable astringency, and hence called wild *Tormentil.* It is a good deal used medicinally in some portions of the Union, and is perhaps nowise inferior to the exotic just mentioned. Found in moist, rich situations, about fence-roads &c. rare.

59. Genus. ROBINIA. *L.* *Locust.*

(*Deriv.* Named in honor of *M. M. Robin*, French botanists who first introduced the tree into Europe.)

Class 17*th.* *DIADELPHIA.—Order, DECANDRIA.*

Gen. Ch. *Calyx* 4-cleft, the upper segment 2-parted. *Vexillum* nearly round, expanded, reflexed. *Pod* compressed, long, many-seeded.

Species 1*st.* Robinia pseud-acacia. *Black locust.*

Sp. Ch. *Leaves* unequally pinnate: *stipules* spinescent: *racemes* pendulous: *pods* smooth.

Obs. My own observations do not agree with those of M. Michaux in regard to the habits of this tree; for although it does occur in profuse abundance in this and other richest lands of Kentucky; yet I have found the largest and most thrifty stocks on the Ohio river in Boon county, seventy miles north of Lexington, where the soil is greatly inferior to that of this vicinity. Its handsome foliage and deliciously scented flowers have long recommended it here, as elsewhere, as an ornamental tree for plantations, street-walks &c. and the excellence of its wood, in point of durability, hardness and strength, particularly recommends it to the attention of landed proprietors. The forests of the adjoining counties furnish a considerable amount of this timber which is used in the construction of Steam Boats: and there is an immense annual consumption of it in making the posts of fences. Within the last few years, however, this excellent tree has sustained serious injury from the depredations of an insect, which penetrates to the very centre of the wood permeating its whole substance with large hollows; in consequence of which many of the finest trees have become destroyed. Where planted in town the locust tree flowers about the

1st of May, those in the country are observed to be a week or ten days later.

60. Genus. PRUNUS. *L.*

(*Deriv.* The latin name for plum: etymology obscure.)

Class 13th. *CALYCANDRIA.—Order, MONOGYNIA.*

Gen. Ch. *Calyx* inferior, campanulate 5-cleft, deciduous. *Petals* 5. *Drupe* even. *Nut* with a prominent suture.

Species 1st. Prunus virginiana. *Wild cherry.*

Sp. Ch. *Racemes* erect, elongated; *leaves* deciduous, oval-oblong, acuminate, shining above, serrate, smooth on both sides; *petioles* with 2-4 glands.

Obs. One of the largest trees of our forests, occurring abundantly on the richest soils, and one of the most valuable of the lumber yeilding kind, in consequence of the beauty, hardness, and durability of its wood, which is more extensively used than any North American tree, in cabinet work. When portions of the tree are selected for this purpose, at the bifurcation of the stocks, the plank, when polished, exhibits a rich and varied appearance, nowise inferior to the best mahogany. Flowers about the 8th of May, and cherries ripen in July: these are dark-coloured, of a sweetish bitter taste. The bark has been long used as a domestic medicine in jaundice and debility. It appears to be a vegetable bitter of some activity, modified in its effects, by a notable portion of prussic acid.

Syn. Cerasus Virginiana. *Mich. Darl. &c.*

Species 2d. Prunus chicasa. *Chickasaw plum.*

Sp. Ch. *Flowers* fasciculate, lateral fascicles sessile; *leaves* narrow lanceolate, serrulate; *branches* spiny, glabrous.

Obs. A small tree ten or fifteen feet high, thickly studded with limbs which are garnished with small shining leaves, persistent to a late season in the fall, and giving to the tree an evergreen appearance. Flowers from 1st to 15th of May: fruit, of a yellowish red colour, ripens in August: it is pleasantly tasted when thoroughly ripe and is frequently preserved with sugar. Frequent in shrubberies occasionally occurring wild.

Syn. Prunus angustifolia. *Marshall.*

(TO BE CONTINUED.)

ART. IX.—*An Address delivered at the Inauguration of the President of Transylvania University, October 13th, 1828.* By Rev. ALVA WOODS, D. D. President of the University.

My respected audience, the subject which I have selected for the present occasion, is, Intellectual and Moral Culture.

The infant enters on life in profound ignorance of his powers and destinies, and of the whole material universe. He endeavours alike to grasp the near flame which would consume him, and the distant orb which circles its way in yonder heavens.—He is not more dependant on others for the aliment which is to nourish his body, than for the instruction which is to give growth and maturity to his mind. It is an ordinance of heaven, confirmed by every injunction to an ancient patriarch to teach his children and his children's children, and by the command of Him who said, "Go, teach all nations," that man is to be the instructor of his fellow man. Where this high ordinance is contravened, where no lights of knowledge are furnished, man can never rise above a mere animal existence. He may have the elements of mind; but they must remain without form and void, and shrouded in darkness deep and impenetrable as that which brooded over chaos before the first creation of light. In him may exist the germ of an intellect, which under genial influences would spread its opening beauties to the gaze of an admiring world. In him may sleep the strength and acumen of a Newton, or the wisdom and valour and patriotism of a Washington; but who shall wake his dormant energies, and point the way to glory and immortality?

The important bearings, on the higher destinies of man, of knowledge and of christian virtue, have been greatly overlooked. It appears not to have been well understood, that without knowledge there can be no useful exercise of virtue; and that without virtue knowledge cannot reach its highest

elevations or accomplish its highest purposes. A consideration of some of the effects of knowledge and of christian virtue on our individual, social, political, and moral interests, may, at this time, well deserve attention.

Let me put it to the sober judgment of any man, for what inducements he would consent never to have any addition made directly or indirectly to his stock of intellectual treasures? Yea, were it possible, let him take a retrograde course, let him annihilate one by one those treasures, and extinguish all the lamps of knowledge and wisdom and experience, which have been successively lighted up in his mind, and what would he give for his existence?

Would the hero of Corsica have sent through Europe an electric shock, which waked the popular energies, and shook the broad foundations of political and ecclesiastical despotism, had his intellect never been invigorated by the discipline of the exact sciences, and animated by the models of patriotic valour which he found in Grecian and Roman story? It were easy to enlarge upon the good which this gifted man might have accomplished, had his mighty powers been under the guidance of moral principle.

Where, in a word, do we look for lofty purposes, for ingenuous dispositions, for illustrious deeds, unless to men of cultivated intellect and extended knowledge?

If from worldly distinction we look to worldly enjoyment, we shall find it in the highest zest with the disciple of learning.—Is he a man of business? The hours not given to his daily occupations, nor demanded by relative duties, are cheered by the delights of letters. The fatigues of his body are forgotten amidst the embellishments of his mind. Visions of excellence and of beauty create a disrelish for whatever is grovelling or deformed, and impart elevation to his conceptions, and dignity to his character. Is he a man of leisure? He is not doomed, like the unlettered rich, to drag out a vacant and restless existence, with mere physical pleasures as his only resource. He never thinks himself less alone, than when, turning his back upon the strifes of the contentious, the gripings of the power-

ful, the over-reachings of the ambitious, he holds converse with the illustrious dead, with the greatest and best men of every age. He walks with Plato in the groves of his Academy. He listens to the lectures of Aristotle in his Lyceum. In the Roman capitol, he is animated by the eloquence and patriotism of Tully; and in Solomon's porch he is made wise by the teachings of Him who spake as never man spake. He needs not offer a bounty for a new pleasure. His pleasures are various as the phenomena of nature; and, unlike those of the sensualist, they never pall upon the taste. Every gratification brings with it a relish for higher and more extended gratifications. His intellectual faculties grow with his growth; and every new acquisition urges him to bolder daring in exploring the depths and ascending the heights of knowledge.

Man's connexion with those around him lays the foundation for a large portion of his present duties.

Is he a parent? The education of his children, however young, is already commenced. Even before they acquire their vernacular tongue, they are forming the dispositions and habits, which will give complexion to their manhood and their old age. They are taking lessons of every body and of every thing around them. To their parents especially they look up for guidance and teaching. Can an ignorant parent open, by the wisest and gentlest means, these budding faculties, and fashion with plastic hand these forming manners? Can he, whose own powers have never been developed, be qualified to develope and nurture the powers of others? Can he, who has never governed his own spirit, nor chastened his own fancy, nor bridled his own desires, give lessons of moderation, of prudence, and of judgment?

Is he an avowed teacher of youth? He has taken upon him duties of high and solemn import. He has undertaken to mould the character of the next generation. He aims at nothing less than to form the parents, the citizens, the teachers, the philosophers, the patriots, and the christians of the coming age. To this formation of character, every teacher, from the nursery to the hall of science, contributes a portion of influence.

From the salutary changes introduced within a few years in

the modes of teaching, and the experiments now making with a view to other changes, it is evident the whole science of education is yet in its infancy. In literature, as in religion, veneration for the mere office of teacher is gone, and in its place is come up a demand for talents, and zeal, and usefulness. Neither youth nor men are any longer to be governed by the mere dint of authority. Public opinion is the lever which moves the world; and governments, whether of schools, or colleges, or states, must yield to its irresistible power.

The general inquiry now is, how can education be made to subserve most effectually our great social, political, and moral interests? What are the best means for training the mind and forming the manners? What are the best schools, not merely for acquiring knowledge, but for increasing mental power, and obtaining mental discipline? for teaching youth to think, and to reason, and to act? What, in short, is the education, which ought to be given to American citizens and American christians in the enlightened 19th century? On this point the sentiment is becoming general that sound learning has not received that individual and that legislative patronage which its connexion with the vital interests of our country demands:—and especially that adequate means are not provided for training men to the important art of teaching. In these arts which contribute to the bodily comfort and fashionable appearance of our children, we seek to employ the skilful; and shall we give their minds in charge to ignorance and to pedantry? Shall the destinies of our posterity and of our country be confided to superficial thinkers, to half educated scholars, to unenlightened and unprincipled pretenders? Genius of Republicanism, forbid it! Spirit of Christianity, avert it!

Is he devoted to the healing art? It is one in which empiricism and quackery cannot now flourish. Though the medical science of our country was at first of slow growth, its recent progress has been rapid beyond example. If a century and a half passed away without one medical school, we now have those which will bear comparison with the oldest and best

schools in Europe; and which are sending skilful practitioners to every corner of our happy land.

The Medical school of this University, by the talents and experience and enthusiastic devotion of its Professors, and by its most admirable lecture-rooms, has already gained for itself a well earned reputation, which is the pledge of its future and increasing glory.

With a vast territory which remains to be explored by the botanist and the chemist, and which abounds in medicinal plants and minerals, the medical science of America is destined to a still wider and nobler range.

Is he devoted to the law? Something more than listless reading for a given time, or even attendance on lectures, is now required as a preparation for this profession. He is expected to engage in exercises akin to those which are to constitute his future occupation. Though all our law-schools are the growth of the last fifty years, much has been done to render easy of access the treasures of this intricate science. But much remains to be done, especially in the common law. While in this country more than in any other, the advantages of the law are brought within the reach of every citizen, much remains to be accomplished to render its language intelligible to the people, and its processes direct; to abolish distinctions where there is no difference; to make its execution expeditious; and to adapt it, in a word, to the changed and improved relations of society. Can this be the work of ignorance?

Is he devoted to theology? The day is gone by, in which the priesthood can be valued for its ignorance. I would be the last to substitute learning for piety. Educating men for the ministry, irrespective of their religious qualifications, will inevitably destroy the soul and vitality of every church which admits the practice. But it is a supposition too absurd to need refutation, that the ignorant are the best qualified to interpret the most ancient writings in existence;—writings composed by various authors during the long interval of nearly two thousand years, relating to a structure of society, to usages, and to natural

scenery, unknown with us, and filled with the loftiest breathings of poetry, and with the holiest fervours of prophecy.

For the success with which learning has been employed in favour of religion, I might refer to the early apologists of christianity, who exposed the gross deformities of polytheism; to the reformation of the 16th century, which followed in quick succession the revival of letters; and to the impugners of modern infidelity, who have triumphantly opposed argument to argument and learning to learning. Had not the sacred oracles, by means of the press, been sent through the various dialects of Europe, the reformation had not been effected. Had not learned defenders of the christian faith been raised up in later times, the enemies of the cross would have succeeded in their attempt to associate, in the public mind, learning with infidelity, and weakness with piety.

It may be said that the primitive teachers of christianity were generally unlettered men. But the miraculous propagation of the gospel, at first, by means apparently inadequate, was designed for the confirmation of our faith, and not for the regulation of our practice in circumstances widely different. The instruments selected for the first promulgation of our religion were successful, because they were wielded immediately by an Almighty arm. How was it that a handful of men, in the midst of persecutions, imprisonments, and death, with no arms but those of persuasion, with no rewards but those which were unseen, spread the religion of their crucified Leader through the Roman empire? It was because disease retired at their bidding. It was because, though they had never been to a school or college, they addressed the Parthian, the Mede, and the Elamite, each in his own language.

Still it should not be forgotten, that our Lord saw fit to employ the cultivated talents of a Paul, to prove to the Jews out of their own scriptures, that Jesus was the Christ, to persuade the learned polytheist on Mars' Hill to turn from dumb idols to the worship of the true God, and to indite epistles of instruction, admonition, and consolation to the churches. If learning was of use in the day of miracles, and in an unenlightened age, can

any one deny its utility when the gift of tongues and the gift of healing have been withdrawn, and when the great mass of society are informed and educated?

In a country in which the people are invested with all the political power, and are called upon, at certain periods, to elect the functionaries of government, the importance of having every man qualified to exercise the right of suffrage, is most obvious. History teaches us that in popular governments, there is a tendency to unsteadiness and fluctuation. The hero of to-day, is too often the exile of to-morrow. Under the guidance of passion and unprincipled demagogues, deeds of violence are committed, for which no subsequent regrets can make atonement. But teach the people knowledge, and you teach them to detect the sophistries of the artful demagogue. Train and cultivate their intellect, and you train them to think before they act, to moderate the violence of their passions, and to resist sudden and misguided impulses of feeling. Instruct them in their various and combined interests, and you prepare them to avoid the evils of excessive legislation; and to show their wisdom in other ways than by perpetual changes in their statute-book.—You prepare them to rejoice in the success of every branch of honest industry; and to look with other feelings than those of envy on the growing wealth of neighbouring nations. Give them enlarged and liberal views of national policy, and they will be too wise to make laws to prevent the exportation of specie, or to preserve the balance of trade with other countries.—Inspire them with the true principles of rational freedom, and their love of liberty will not degenerate into licentiousness, nor contract into an exclusive and selfish patriotism. Make them intellectual and thoughtful, and neither the gladiatorial contests of ancient Rome, nor the modern bull-fights of Madrid, nor the boxing-matches of England, will be the sports of their delight. Give them habits of industry and economy, and you secure to them a surer source of enjoyment, of independence, and of wealth, than would be furnished by all the golden mines of Spanish America.

Why was not old Spain able to maintain her constitution

against the inroads of priestly and kingly power? In answer I refer to a fact lately stated in a London Review, that in Spain, with a population larger than that of the United States, there are only sixteen periodical journals, while in the United States there are eight hundred. Had the population of Spain been sufficiently enlightened to appreciate the blessings and to exercise the functions of a free government, they would have made every pass in the Pyrrenees a Thermopylæ, and every plain a Marathon, sooner than submit to the dictation of a foreign soldiery.

Why are those combined efforts among the hereditary governments and mighty hierarchies of continental Europe, to suppress the circulation of the Bible, to stop the preaching of the christian missionary, to establish a censorship of the press, and to shut up every avenue through which light may be poured in upon the popular mind? They dread the effects of knowledge. They fear their subjects will become too wise to submit to ecclesiastical domination and to political misrule.

What would become of the wealth and proud ascendency of England, were it not for her commerce and her navy? And what would become of her commerce and her navy, were it not for her mechanic arts, and her astronomical observations? Yea, where would have been the wealth of our cities, and the far-famed enterprise of the American mariner, had we not been able to call in the aid of English astronomy? How long we shall be subjected to this state of dependance, is for the intelligent and lofty spirit of the American patriot to determine.

In proportion to the intelligence of the people will ultimately be their freedom; and in proportion to their freedom must be their intelligence in order to maintain that freedom. What obligations then rest on every American, to cultivate his own intellectual powers, and to diffuse the light of knowledge around him! Does he love his tender babe and the companion of his bosom, and thank his God that no hand of violence will snatch them from his embrace? Does he love his Bible, and offer up daily thanksgivings that no ecclesiastical power will deprive him of its precepts and consolations? Does he rejoice in the increas-

ing glory and prosperity of his country? As he values these blessings and wishes their continuance, let him give the full measure of his influence and patronage to every nursery of mind from the infant school to the University. Let him not suffer the youth of the State to grow up in ignorance, or leave them to resort to some distant focus of learning, or to collect here and there a few divergent rays. Let him bring the rays of knowledge near and thick around every family and every member of the Republic. Let our land be made a Goshen, having light in all its habitations.

While it is necessary for the general interests of literature, that the study of the learned languages should occupy a place in our higher seminaries of learning, still, for the purposes of political safety and of practical morality, a thorough education in the exact sciences and in English literature is all that is necessary. Such an education it will be our aim to give in connexion with Transylvania University.

It is said by the opposers of universal education, that teaching persons in the lower walks of life will elevate them above their business, and disqualify them for the exact and faithful performance of their duties. But has the inspiration of the Almighty given man understanding, and will that understanding more surely mislead him the more it is enlightened? Will a rational creature be more disposed to transgress the laws of God and man, the more he understands those laws and the obligations by which they are enforced? Are the citizens of those States of the Union, in which a common education is universal, less industrious and frugal, less attentive to the duties of the social compact and to all the tenderer charities of life, less moral and religious, than others who have had no education?

By an estimate made a few years since in Great Britain, it appeared that the number of persons convicted of capital offences in Scotland was very small compared with the number in England;—and that nine-tenths of those convicted in England could not read.

A similar investigation in this country would undoubtedly

lead to a similar result. Our convicts are commonly as destitute of learning as they are of moral principle.

An ignorant man is always a dangerous member of the community. Incapable of understanding the blessings of civil or religious freedom, he is at all times the prepared dupe of every political or ecclesiastical demagogue.

Education enters deeply into any true system of political economy. In a late lecture before one of the Institutes of Paris, the Baron Dupin makes this statement; "that in some parts of France those who are educated are one tenth, in others one twentieth, and in others only one two hundred and twenty-ninth part of the whole population; and that the national revenue of these districts is nearly in corresponding ratios: nay, more, that these proportions are not materially varied by the most striking inferiority or superiority of soil or climate."

The value of religion, both as a principle of action and as an example, depends upon the degree of knowledge with which it is combined. However much of christian benevolence a man may possess, it will be of little service to the community, unless he knows how to exercise it; unless he understands the best plans of doing good, and has influence to carry those plans into execution. But a man without knowledge, must be without influence.

Look at the moral condition of the different nations of Christendom, and see the legitimate effects of knowledge. Compare South America with the United states, Italy with England, Spain with Scotland, and you will observe as marked a difference in their moral as in their intellectual character.

Look at the state of science among pagan nations. Where is the pagan country which possesses any knowledge of medicine, of astronomy, of mechanics? The superiour science of christian nations may be made powerfully instrumental in evangelizing the world. It may be made to demolish in the mind of the idolater the fabric of his false philosophy and his religious superstitions. Convince him of his mistake in supposing that an eclipse of the sun or moon is occasioned by a dragon whom a loud noise may frighten to let go his hold on the luminary. Con-

vince him of his error in imagining that volcanoes are the sacred dwellings of the gods, whose awful abodes cannot be approached with impunity. Prove to him by the testimony of credible travellers, that the earth is not divided into seven islands and seven oceans. Convince him of such errors, and you weaken his faith in the whole system in which he has been educated. Show him the superiority of your mechanical philosophy, and its application to the arts and the comforts of life, and he will bow with deference to your opinions. He will think it very possible that in religion as well as in science you may be his superiour. This, you are aware, has actually been the effect of the Hindoo college in the East-Indies, in which three hundred native youth are now receiving a liberal education.

Let it not be inferred from what has been said, that I would prefer talents to virtue, or greatness to goodness. Great talents are valuable, only as they are rendered subservient to purposes of benevolence. Under an obliquity of moral principle, brighter reason prompts to bolder crimes, and an increase of intellectual capacity, is an increase of the power of mischief. Invest a malevolent being with infinite wisdom and unlimited power, and you make him the terror and scourge of the universe. All intellectual culture is to be regarded simply as means to an end;—as power to do good, or to do evil. It is the province of a refined moral sensibility to put an accurate value on the different kinds of knowledge, and to pursue each in proportion to its worth. It is only in a healthful state of the moral faculty that we make the distinction between justice and success, between the *love* of excellence and the love of excelling.

While we are disposed to allow, to their full extent, the pleasures of literary pursuit and the important advantages of intellectual illumination, it must be confessed that man has wants which nothing can supply, and woes which nothing can relieve, but the sanative influence of religion. What can moderate anger, resentment, malice, or revenge, like the thought that we may ask God to forgive our trespasses only as we forgive the trespasses of others? What can quiet murmurings at our lot, like that deep sense of moral demerit which the gospel presses on

the conscience? What can cool the burnings of envy, or allay the passion for renown, like a remembrance of the transitory nature of all human glory? What can produce resignation to the loss of friends, like a confident hope of meeting them soon in a brighter world? What can prompt to deeds of benevolence, like the example of Him, who, though he was rich, for our sakes' became poor? Is there any thing which can give steadiness to purpose, or stability to character, like an unwavering regard to the will of God? Considerations of mere worldly policy, or interest furnish no steady magnetic influence to give one uniform direction to all the plans and actions of life. Patriotism may fire the spirit with valour to sustain the onset of an invading foe, and bare the breast to the rushing tide of war:—but who can meet with unruffled temper the thousand petty ills that life is heir to, like *him* whose aim is heaven? What sublimity like moral sublimity, whether we regard the grandeur or permanency of its effects? What more sublime than the triumphs of a dying christian, when in the midst of its decaying and crumbling habitation the spirit plumes itself for its lofty flight, and departs in the buoyancy of hope, for the regions of eternal day? But these are not fruits of earthly growth. These are the gifts of christianity.

But it is on man in his social capacities and political relations that moral principle is destined to exert its most important influence. It is in society that man has power. It is in society that virtue developes its benevolent tendencies, and that vice scatters fire-brands, arrows, and death. Has the example of vice wrought powerfully, so has that of virtue. Have many been beguiled to their destruction by the enticings of the sinful, multitudes have been allured by the persuasions of the good, to fairer worlds on high.

None will deny that a reputation for integrity and uprightness is of the last importance to a public man. But how can he get that reputation so surely as by being upright and honest? Politicians will sooner or later learn, that there is no such thing as political integrity in contradistinction to moral integrity:—that nothing which is morally wrong can be politically right. In-

trigue and crooked policy may sometimes secure present success and temporary elevation. But this success is transient as the flight of the meteor, which calls our attention only to witness its fall. Character will find its level. Virtue will be honoured with reputation and esteem; and a dereliction of principle will be visited with shame and contempt. The crafty and over-reaching statesman will inevitably lose that very fame for which he treads many a devious path; and instead of securing permanent applause, will consign his name to ignominy and execration. It matters not to what lofty and undisputed ascendency he may rise, or within what ramparts of power he may intrench himself, the days of his reputation are numbered. The prophecy of his overthrow is delivered.

Nor is moral principle less indispensable to national than to individual prosperity. National virtues secure with unerring certainty true national glory; and national vices are followed by a train of national calamities. The true glory of a nation consists in the goodness of its laws and in the wisdom of their administration; in fairness in making treaties and fidelity in maintaining them; in habits of probity and of punctuality in all the relations of social intercourse; in the temperance, and comfort, and intelligence of the citizen;—in valour in repelling foreign invasion, and watchful vigilance in the guardianship of its liberties.

But in the absence of moral principle, what safeguard is there for the rectitude of fair and just dealing between man and man, and between nation and nation? What is there to prevent the eternal principles of right and the plain virtues of honesty and integrity from being sacrificed at the shrine of a time-serving expediency? What is there to curb the impetuosity of passion, or the cravings of cupidity? If Philip of Macedon deemed no city impregnable into which he could introduce an ass laden with gold, must not a political community look for safety to the conservative influence of a lofty and uncompromising morality? General knowledge among our citizens is essential to the perpetuity of our free and happy republic. But something more is necessary. An individual may know his own interests and yet

miserably sacrifice them at the bidding of some licentious passion. A man in public life may know the best interests of his country, and yet treacherously betray them. To knowledge then must be added virtue.

No political or literary Institution, which discards the influence of moral and religious principle, can expect the blessing of Almighty God. Gentlemen, I would not hope for the prosperity of this University, for whose welfare I come to toil, unless it be reared on the broad and deep basis of christian principle. While, therefore, the teachers of this literary Institution inflexibly refuse to descend into the arena of political strife, or of theological controversy, let them make it their first and last aim to serve their country and their God. Let them lead their pupils not only to the waters of Castalia, the resort of the Muses, but also to "Siloa's brook, that flowed fast by the oracle of God."

And if the noble and dear bought heritage of our freedom is to descend an undiminished patrimony to our children and our children's children, it must be by the agency of principles which bring the retributions of a future world to bear upon the destinies of the present. For myself, I look to religion as the ark in which our liberties are to be preserved: not by an unholy alliance of Church and State, but by the bland and reforming influence of this religion on the manners and morals of the community, on the hearts and the lives of our citizens.

This religion, which we regard as the Palladium of our freedom, is in its genius republican. It teaches the doctrine of equal rights and privileges. It is not limited like the ancient pagan religions, to a few of the noble and learned who may be initiated into its mysteries. It addresses its mandates alike to rulers and to people, to masters and to servants; and carries its consolations and hopes alike to the cottage and the palace. It commands its teachers to announce its glad tidings in the hearing of every rational creature. It acknowledges no privileged aristocracy. The philosopher and the peasant, the man of letters and the man of business, are equally called to bow to the supremacy of its authority.

Let this religion, which is thus fitted to our republican insti-

tutions, send its healing influences through all the ramifications of society, and we will never despair of the republic. There will ever be found among us a redeeming spirit, which will save us from the misrule of tyranny, and the pitfalls of anarchy. Let *public opinion be enlightened* and *public morals be untainted*, and we may bid defiance to the underminings of internal corruption, and to the incursions of the proudest foreign foe. Let me then adjure you, who love your country, to see that there be no ignorance, to misguide public opinion, which you can instruct; and no vice, to pollute the fountains of morality, which you can reform. Put forth your utmost energies to render the irradiations of knowledge and the renovating power of religion universal;—and, whatever may become of our beloved country, you will merit a triumph at her hands, and will ultimately receive the rewards of well doing. Proclaim a war of extermination against ignorance and vice:—and withered be that arm which is raised for their defence.

Invited by the the unanimous suffrages of the trustees of this University to watch over its interests and to labour for its welfare, I come, Gentlemen, to cast my lot among you, and to unite my fortunes and my destinies with yours. To the diligent discharge of the duties of that high office, with which your Chairman, in your behalf, has now invested me, I solemnly pledge myself, relying on your candour, your counsels, and your support.

Fellow citizens, I should not have come thus far away from dearest kindred and friends, unless possessed of confidence in your virtues, and untiring co-operation to promote the interests of good letters. Your kind and hospitable attentions to strangers, the warmth of your friendships, the liberality of your donations to praise-worthy objects, your promptitude in action, your fearlessness in danger, and your turning the wilderness into a fruitful field, cannot be forgotten. Those, who have been thus foremost to fell our forests and our foes, will not be the last in the race of literary enterprise and in the march of intellectual improvement. What the citizens of this town and county are doing to sustain this institution is a most cheering indication of public

sentiment. It will embalm your names in the memory of the virtuous; and transmit to ages yet unborn the manifold blessings of education. Let every man do his duty, and I say with confidence that, under God, Transylvania shall be the delight and glory of the West.

BIBLIOGRAPHICAL NOTICE.

ART. X.—*A Discourse on the Genius and Character of the* REV. HORACE HOLLEY, L.L.D. *late President of Transylvania University, by* CHARLES CALDWELL, M.D. *Professor of the Institutes of Medicine and Clinical Practice in said University; with an appendix containing copious notes biographical and illustrative.—pp.* 302. 8vo. Boston, 1828.

Although this is not a work of the kind which we purpose even to notice, much less review in this Journal, yet there are connected with it various considerations which render it not only admissible, but, as we believe, a matter of duty in us briefly to introduce to the attention of our readers.

To say nothing of his splendid talents and peculiar distinction, and of the inordinate loss which science and letters have sustained in his death, Dr. Holley, being the President of a University, was essentially connected with each of the three learned professions. He had been President of Transylvania, whose name this Journal bears: he was highly instrumental in the establishment of the medical department of the Institution, of whose faculty we ourselves form a part. For these and other reasons, we say, we feel it to be our duty to notice the work.—And we are the more highly rejoiced to be able warmly to concur with others in doing it favourably, in as much as we understand that the proceeds of the sale of it are intended for the sole

benefit of the very amiable and accomplished widow and the orphan son of the deceased.

This discourse, as is well known to the majority of our readers, was prepared at the request of the medical students of Transylvania University, and delivered before them and the public, at the commencement of the last session, (November, 1827). Immediately upon its delivery a unanimous call was made upon the Professor for a copy for publication:—this was assented to; and arrangements forthwith were made for printing it. About this time Mrs. Holley arrived in Lexington, on her return from that disastrous voyage which she has so feelingly described in the appendix to this discourse, and which had been the unhappy cause of the discourse itself. The manuscript was submitted to her; and on reading it she expressed her desire that it might be printed in a manner which its excellence merited, and that it should be rendered still more worthy of public patronage, by the addition of biographical and *illustrative* matter. Her wishes were expressed to the medical class through Dr. Caldwell, to which she received the most respectful and cordial assent. This was gratefully acknowledged in the following letter, which, in consequence of the deep-toned feeling that it breathes, and the suavity of manner so characteristic of the fair writer, we feel authorized to extract from the advertisement to the volume.

"*Lexington, February* 18, 1828.

DEAR SIR,

I have read with lively interest the communication of the Medical Class which you were so kind as to send me. Such an expression of respect, so spontaneously rendered, to one whom they had so little opportunity to know, and founded on a claim so sacred and delicate, is alike honourable to them and flattering to me. It is not only a chivalrous manifestation of the elevation of feeling which belongs to gentlemen, but it carries to my heart a new conviction of the benevolence of the human character. The misfortunes, which pressed so heavily upon me during the past year, have furnished ample evidence of that benevolence. Thrown upon the wide ocean, helpless, unprotected, sinking under complicated calamities, with nothing of life left but a sensibility to suffering, had it not been for the manifold displays of

that disinterestedness, I too had found a grave. To your sex, under Heaven, the praise is due; and it is grateful to the pride of my nature, as it is soothing to my self-love, to add another proof to my fruitful experience.

I will thank you, Sir, to communicate to the Class the grateful sense I entertain of their magnanimous conduct. Perhaps, too, I owe them an apology for interfering with their rights—they having a prior claim to your Discourse, which they have so generously waved on my account. They must find an excuse in the hurry and warmth of my feelings, as remoter interests usually give way to those which are nearer and more exclusive. I relied on a principle in our nature, in which the ingenuousness of their conduct proves that I was not mistaken. They will readily pardon a solicitude, which I, in common with the family of my late husband, could not but feel, to preserve some memorial of the genius and character of him whom we have lost; some testimony of his talents and virtues; and of the full, honest, unwearied, almost heroic exertion of them. We wished it to be a comprehensive, permanent, not a cheap, ephemeral work—to be in an elegant form, and in all respects, worthy of the subject, of the friends, and of the liberal individuals to whose generous, but voluntary contributions, we would wish to owe it. They cannot fail to see, also, in the claims of my son, the son of him who was devoted to the interests of education, to whom this school owns its obligation, and who was at last sacrificed to those interests, motive to exertion equally sacred and imperative.

As you have generously consented to aid me in presenting to the world the predominant features of the great light which has gone out, you will have a corresponding sympathy, equally divested of any selfish impulse, in expressing to the little world to which your labors are now directed, the grateful sentiments of her who is left in darkness.

Yours very sincerely,

M. A. Holley."

In accordance with this arrangement the publication of the discourse was transferred to Boston, where it was printed, during the last summer, under the immediate superintendence of Dr. Caldwell and Mrs. Holley; and from that place we have just received it, in a garb worthy of the subject of it, the orator, the annotators, and the press from which it emanates.

In the quality of the paper on which it is printed, and as an elegant specimen of typographical execution, the volume before us may, indeed, be almost said to stand alone. It does much credit, therefore, to the taste and liberality of those who con-

ducted it, and is, in a high degree honorable, not merely to the press from which it issued, but to the art of printing in the United States.

The portrait of Dr. Holley which it contains is a handsome and tasteful engraving: but we regret to say, that the likeness is not so striking as we could have wished: a better one we think might have been taken from the painting of our lamented townsman, Jouett. The work is ornamented with two other very appropriate plates; a lithographic view of the place where Dr. Holly was born, and a correct engraving of Transylvania edifice in which he presided.

But its typographical and mechanical execution are not the only excellencies of this volume: in the style and manner of the writing there is unusual variety. Nor could it well be otherwise; as it is the production of several writers; the sprightly and bewitching pen of Mrs. Holley having had an extensive concern in it. She is understood to have written notes A and G of the appendix, containing narratives of the early life of Dr. Holley, and of his visit to New-Orleans and death.

We do not know that the volume has yet been reviewed in the Boston North American; but in most of the daily and weekly papers, and in some of the monthly periodicals of that literary metropolis, it is recommended as a work of distinguished merit and peculiar attractiveness. From some of these, and from Mr. Flint's Western Review we will content ourselves to make a few extracts; since, as before remarked, the matter of the work itself does not legitimately fall within the purview of a Medical Journal.

The New-England Galaxy, which is confessedly the ablest and most literary weekly paper in the Union, in a well written analysis of the volume, thus notices it:

"Of the style of composition observable in this volume we may say, that the *Discourse* is worthy of the writer and the subject. In copiousness of language, or to use his own favourite expression, in opulency of diction, he has poured out the feelings of a heart that was fashioned to feel. He has spoken like one who knew and could not withhold the estimation which all should have of the usefulness of the life, and

the misfortunes of the death of Mr. Holley. In eulogizing, he has not forgotten to speak of defects; in alluding to misfortunes, he freely and boldly states their causes; and in setting forth the virtues and talents of his friend, he portrays the ruinous vindictiveness of his foes."

"That portion of the notes written by Mrs. Holley proves that the influence of the mind of her venerated husband, exalted and strengthened whatever was within its reach. Under such influence it is not surprising that a female could attain to a dignified, perspicuous, elegant style of thinking and expression. Her writing exhibits intellectual power, in selecting and arranging the most interesting topics, as well as in presenting them forcibly; and with a few unimportant exceptions, her department of this biography could not have been better executed."

The following commendation of the work is from the pen of one of the most gifted and accomplished scholars of our country.

"I have looked into the volume just published on the life and character of Dr. Holley. It is to me full of interest and no small share of instruction. The sketches of his talents, character, studies, acquirements and opinions, are drawn with great vividness and strength, and have increased and exalted my sense of his genius and worth.

"The account of his last illness and death, is one of the most beautiful, touching and pathetic narratives I have ever read. It affords another proof, that the tales of real life, told by those who have felt what they describe, and have known what they relate, have more power over the human heart, than the brightest imaginings of fiction. I am delighted to have the privilege of placing such a work in my library."

Mr. Flint in an able, and as we think impartial, survey of the volume, published in the September number of his "Western monthly Review," makes the following remarks.

"Though the Discourse purports to be an eulogy of president Holley, it touches in passing 'de omni scribili,' and proves to be a peg, upon which the author hangs many an eloquent and ingenious disquisition upon various points of philosophy and literature. The warp is often of one thread, and the woof of another, differing both in material and colour; and yet the whole web is woven with a close wail, and proves to be a mosaic tissue, splendid even to gorgeousness. That the harangue is exuberant, full of "fiery fancies," fervid, powerful, and in his own peculiar phrase, redundant in 'opulency and magnificency,' we hold to be so obvious, that none but a flippant tyro, or an adust and bilious hypercritic, could think of denying it these attributes."—"But there is through the whole such a manifestation of robust and

manly power of thought, and such a felicity of figure and illustration, that, carried along with the current, we do not pause to survey minor defects."—"The whole forms a biography of the deceased, as complete as the materials in possession may furnish; and given in a book of the most splendid execution, will remain to the days to come, a memorial and a synopsis of the moral and intellectual character of the deceased."

From the foregoing notices of the work we are considering, we feel no disposition, because we perceive no just ground, to detract or dissent. We deem it, in all respects, worthy of the subject of it, who is known to have been justly ranked among the most highly accomplished and rarely gifted men of the day; and we conclude by recommending it warmly to the patronage of our readers.

OBITUARY.

Died in Jessamine County, Kentucky, on the 16th day of September, after a long confinement with bilious fever, Dr. Anderson Watkins of Augusta, Georgia, aged 54 years.

Dr. Watkins was a native of Virginia, but emigrated at an early age to Kentucky, and resided for a short time at Louisville. He did not, however, long continue in this State before he removed to Georgia, and settled in Augusta, where he resided for many years as a practitioner of medicine. From that place he set out on a tour of recreation during the last Spring, and returning from the North, with the intention of visiting his friends in Kentucky, he sickened of fatigue and fever, and died at the house of Lewis Nuckols Esq., his brother-in-law, in the neighbourhood of Lexington.

We had not the pleasure of an acquaintance with Dr. Watkins until his last illness, during which, however, we had ample opportunities of witnessing in him, the honorable bearing of a gentleman,—the devoted affection of a husband,—the meek, resigned and patient temper of a christian. We have learnt that his standing as a practitioner of medicine was highly respectable, and that by laborious attention to his duties he had amassed a large fortune.

Died at Franklin, Tennessee, on the 20th of August, of pulmonary disease, Dr. Leander Hughes, in the 23d year of his age.

Dr. Hughes was an eleve of Transylvania University, in which he graduated at the last commencement, in March 1828, with much reputation, although he had been precluded, by the delicate state of his health, from close application to study for some months before. The amiableness of his disposition had endeared him to all who knew him, while his highly respectable attainments, and habits of studious attention, gave an earnest of future eminence in his profession.

ART. XIII.—*Meteorological Journal from June to September, 1828.* By THOMAS J. MATTHEWS, A. M. Morrison Professor of Mathematics and Natural Philosophy, in Transylvania University.

June.

Dates	Thermometer. Sunrise	3 P. M.	Sunset.	Mean of Barometer.	Prevailing Winds.	General Remarks.
1	57°	72°	66°	28,960	Calm	Cloudy.
2	63	80	73	28,818	S. W.	Rain, cloudy.
3	70	85	82	28,948	S. W.	Clear.
4	73	85	77	29,032	S. W.	Clear.
5	73	87	78	29,076	Calm	Clear.
6	73	83	78	29,004	S. W.	Clear, cloudy.
7	71	80	70	28,957	E. & W.	Cloudy, clear.
8	67	77	70	28,949	West	Clear.
9	60	77	71	28,948	Calm	Clear.
10	67	80	70	28,895	W. & S.	Clear, rain.
11	67	71	67	28,933	S. W.	Rain, cloudy.
12	67	68	66	28,926	S. & S. W.	Rain, cloudy.
13	67	72½	67	29,017	Calm	Cloudy, clear.
14	70	78	71	29,138	do. & S. W.	Clear.
15	72	80	75	29,120	S. W.	Clear, cloudy.
16	70½	81	77	29,033	S. W.	Rain, clear.
17	70	82	71	29,012	S. W. & W.	Clear, rain.
18	71	79	72	28,943	SW. NW.	Cloudy.
19	67	78	73	28,937	East	Cloudy.
20	72	82	72	28,969	South	Clear, rain.
21	70	78	71	28,998	South	Cloudy, rain.
22	70	78	77	29,084	S. W.	Rain, cloudy.
23	73	84	79	29,090	Chang	Clear.
24	75	85	78	29,060	Chang	Clear.
25	73	87	79	29,058	Calm	Clear.
26	76	86	82	29,097	S. E.	Clear, cloudy.
27	75	79	75	29,065	S. W.	Cloudy, rain.
28	74	82	76	29,013	Varia.	Cloudy.
29	73	80	73	28,915	S. W.	Clear, rain, cloudy.
30	66	78	70	28,960	Calm	Clear, cloudy.
	69.7	79.8	73.5	28.868		

Mean height Thermometer, - - - - - 74 1-2°
Greatest height Thermometer, - - - - 87°
Least height Thermometer, - - - - 57°
Mean height Barometer, - - - - 28.998 inch.
Greatest height Barometer, - - - - 29.150 inch.
Least height Barometer, - - - - 28.840 inch.
Quantity of Rain, - - - - 3.1497 inch.

Date.	Thermometer. Sunrise	3 P. M.	Sunset.	Mean of Barometer.	Prevailing Winds.	General Remarks.
1	68°	76°	67°	28,937	S.W.&W.	Clear.
2	61	65	64	28,974	N. W.	Clear, cloudy.
3	56	72	66	29,043	N. W.	Clear.
4	60	73	64	29,129	N. W.	Clear.
5	57	75	66	29,118	S. W.	Clear.
6	62	78	70	29,070	S. W.	Clear.
7	67	80	75	28,952	S. W.	Clear, cloudy.
8	64	76	70	28,846	S. W.	Rain, clear.
9	64	74	67	28,913	Varia.	Clear.
10	61	76	67	28,945	S. W.	Clear.
11	67	78	68	29,007	W.&N.W	Cloudy, clear.
12	64	80	74	29,027	E. & Calm	Clear.
13	73	76	75	28,895	West	Cloudy, rain.
14	67	74	69	28,820	West	Clear, cloudy.
15	62	72	68	28,945	Varia.	Cloudy, clear.
16	62	76	70	29,078	Calm&NE	Clear.
17	62	76	72	29,135	N. E.	Clear.
18	62	77	72	29,075	Calm–SW	Clear.
19	65	79½	74	29,003	Varia.	Clear.
20	70	80	74	28,933	NW.–SW.	Clear, rain.
21	70	80	72	28,943	S. W.	Clear, rain, cloudy.
22	70½	79	72	29,020	S. W.	do. do. do.
23	72	82	77	29,045	West	Clear.
24	73	83	77	29,010	Varia.	Clear, some clouds.
25	74	80	78	28,990	Varia.	Cloudy, showers.
26	77	79	80	28,947	Varia.	Clear, rain, cloudy.
27	76	77	73	29,062	W.&S. W.	Cloudy, rain, clear.
28	68	75	68	29,180	Varia.	Cloudy, clear.
29	62	77	68	29,192	Calm	Clear.
30	62	79	70	29,165	Calm-NW	Clear.
31	65	77	74	29,095	Varia.	Cloudy.
	69°	75°	73°	29.015		

Mean height of Thermometer, - - - 71½°
Greatest height of Thermometer, - - - 83°
Least height of Thermometer, - - - 56°
Mean height of Barometer, - - - 29.015 inch.
Greatest height of Barometer, - - - 29.215 inch.
Least height of Barometer, - - - 28.815 inch.
Depth of rain on a level, - 2.231 inch.

Date.	Thermometer. Sunrise	3 P. M.	Sunset.	Mean of Barometer.	Prevailing Winds.	General Remarks.
1	73°	83°	78°	29,053	Varia.	Cloudy.
2	74	85	80	29,070	S. W.	Cloudy.
3	70	74	72	29,057	Varia.	Cloudy.
4	64	70	66	29,108	W.&S. W	Cloudy.
5	60	78	68	29,086	S. W.	Clear.
6	62	80	70	29,119	S. W.	Clear.
7	63	80	72	29,172	S. W.	Clear.
8	65	80	74	29,191	Varia.	Clear.
9	68	83	78	29,083	Varia.	Clear.
10	73	79	76	28,984	S. W.	Cloudy, rain.
11	70	77	71	29,015	West	Clear.
12	64	79	69	29,075	S. W.	Clear.
13	69	79	74	29,104	S. W.	Cloudy.
14	71	78½	70	29,005	S. W.	Cloudy.
15	67	75	68	29,087	West	Rain, cloudy.
16	64	76	69	29,117	Calm	Clear.
17	68	78	74	29,028	W.&S.W.	Clear.
18	65	73	66	29,163	North	Clear.
19	60	72	67	29,230	Varia.	Clear.
20	65	80	74	29,232	N.W.&S.	Clear.
21	67	81	76	29,283	E.&S.	Clear.
22	69	83	75	29,327	Calm	Clear.
23	70	81	73	29,345	Varia.	Clear.
24	67	84	73	29,285	SE.&SW.	Clear.
25	67	84	74	29,253	S. E.	Clear.
26	67	86	80	29,250	Varia.	Clear.
27	67	85	79	29,265	Calm	Clear.
28	70	87	80	29,299	Varia.	Clear.
29	70	86	83	29,250	E.&S. W.	Cloudy.
30	71	88	85	29,243	East	Clear.
31	74	84½	81	29,227	S. W.	Cloudy.
	67½°	80½°	74°	29,2905		

Mean height of Thermometer, - - - 74°
Greatest height of Thermometer, - - - 88°
Least height of Thermometer, - - - 60°
Mean height of Barometer, - - - 29,2905 inch.
Greatest height of Barometer, - - 29,360 inch.
Least height of Barometer, - - - 28,952 inch.
Quantity of Rain, - - - - 1,496 inch.

Date.	Thermometer. Sunrise	3 P. M.	Sunset.	Mean of Barometer.	Prevailing Winds.	General Remarks.
1	71°	80°	75°	29,045	S. W.	Rain.
2	63	71	64	29,022	N. W.	Cloudy.
3	56	61	58	29,082	N.W.&W.	Cloudy.
4	51	61	54	29,124	W.&S.W.	Cloudy.
5	50	70	64	29,159	S. W.	Clear.
6	52	72	70	29,225	S. W.	Clear.
7	59	74½	70	29,152	S. W.	Clear.
8	64	60	52	29,098	Varia.	Rain.
9	50	58½	58	29,228	Varia.	Cloudy.
10	45	67	62	29,287	Calm	Clear.
11	50	73	68	29,287	South	Clear.
12	57	76	74	29,257	Calm	Clear.
13	64½	79	76	29,155	S. W.	Cloudy.
14	66½	69	69	29,049	S. W.	Rain.
15	68	71½	70	29,039	Calm	Cloudy.
16	64	71	65	29,185	Varia.	Cloudy.
17	60	70	66	29,263	Varia.	Cloudy.
18	62	73	66	29,262	N. E.	Cloudy.
19	57	70	64	29,200	Calm	Clear.
20	62	74	68	29,078	South	Clear.
21	65	77	72	29,080	South	Clear.
22	68	79	72	29,124	S. W.	Clear, rain.
23	68	63	60	29,152	S. & S. W.	Cloudy, rain.
24	56	73	71	29,097	S. S. W.	Clear.
25	54	60	57	29,179	S. W. W.	Cloudy.
26	55	62	55	29,249	North	Cloudy.
27	48	67	60	29,215	N. & S. W.	Clear.
28	55	65	58	29,245	S. W.	Clear.
29	42	66	57	29,260	East	Clear.
30	48	64	62	29,074	South	Cloudy.
	57½°	69½°	64½°	29,029		

Mean height of Thermometer, - - - 63½°
Greatest height of Thermometer, - - - 80°
Least height of Thermometer, - - - 42°
Mean height of Barometer, - - - 29.029 inch.
Greatest height of Barometer, - - 29.316 inch.
Least height of Barometer, - - - 28.925 inch.

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